TENSAI
INTERNATIONAL

TCT-21BKX

TCT-54BKX

Service Manual

SAFETY INSTRUCTIONS

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" BELOW.

■ X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is 25.5kv (21": 28.3kv) at zero beam current (minimum brightness) under 220V AC power source. The high voltage must not, under any circumstances, exceed 27.5kv (21": 29.0kv). Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure on page 5 of this manual. It is recommended the reading of the high voltage be recorded as a part of the service records. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.

■ SAFETY PRECAUTION

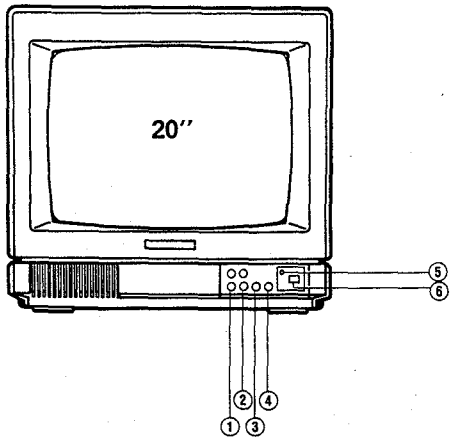
1. Potentials as high as 25000 (21":26500) volts are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back board removed involves a shock hazard from the receiver
   1) Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment.
   2) Always discharge the picture tube anode to the receiver chassis to avoid the shock hazard before removing the anode cap.
   3) Discharge the high potential of the picture tube before handling the tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled.
2. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement parts list.
3. When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor 10mm away from circuit board.
4. Keep wires away from high voltage of high temperature components.
5. This receiver must operate under AC 220 volts. 50Hz NEVER connect to DC supply or any other power or frequency.

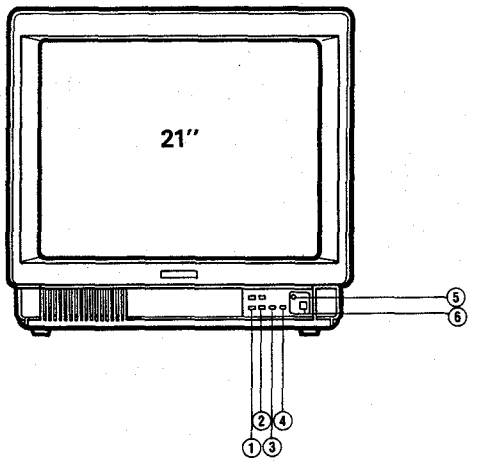
■ PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are identified by shading on the schematic diagram and the parts list.
Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY RADIATION.

LOCATION OF CONTROLS

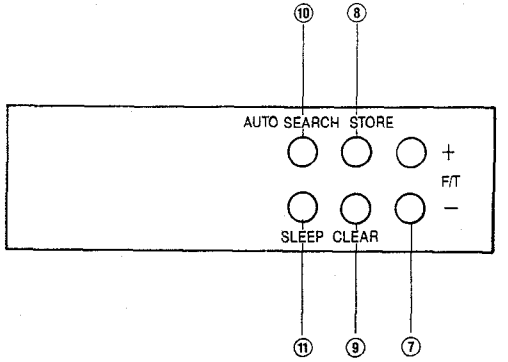
■ FRONT VIEW





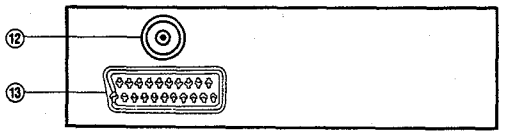
① CHANNEL UP/DOWN BUTTON (CHANNEL +, −)
② ANALOG UP/DOWN BUTTON (ANA +, −)
③ ANALOG SELECTOR BUTTON (ANA SEL)
④ MAIN POWER SWITCH (POWER)
⑤ STAND-BY INDICATOR (STAND BY)
⑥ INFRARED SENSOR WINDOW (REMOTE SENSOR)

■ CONTROL BOX



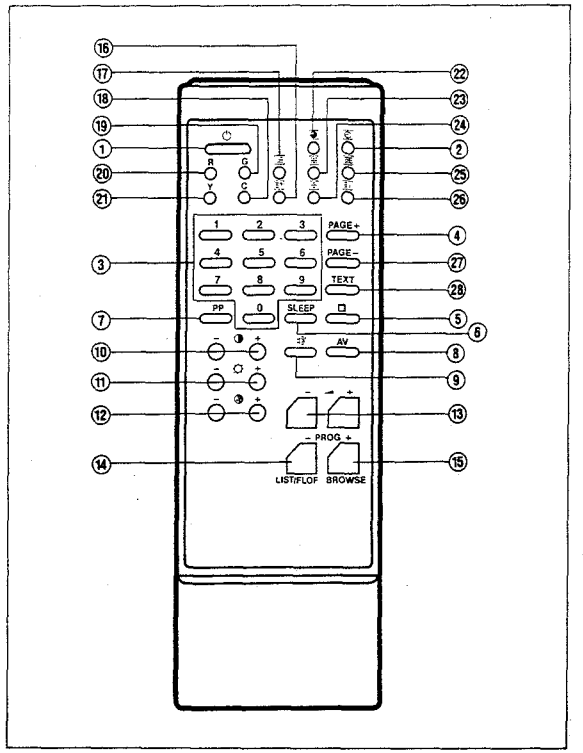
⑦ FINE TUNING UP/DOWN BUTTON (+, −)
⑧ STORE BUTTON (STORE)
⑨ CLEAR BUTTON (CLEAR)
⑩ AUTO SEARCH UP BUTTON (AUTO SEARCH)
⑪ SLEEP TIMER BUTTON (SLEEP)

■ REAR VIEW



⑫ ANTENNA TERMINAL
⑬ 21 PIN SOCKET

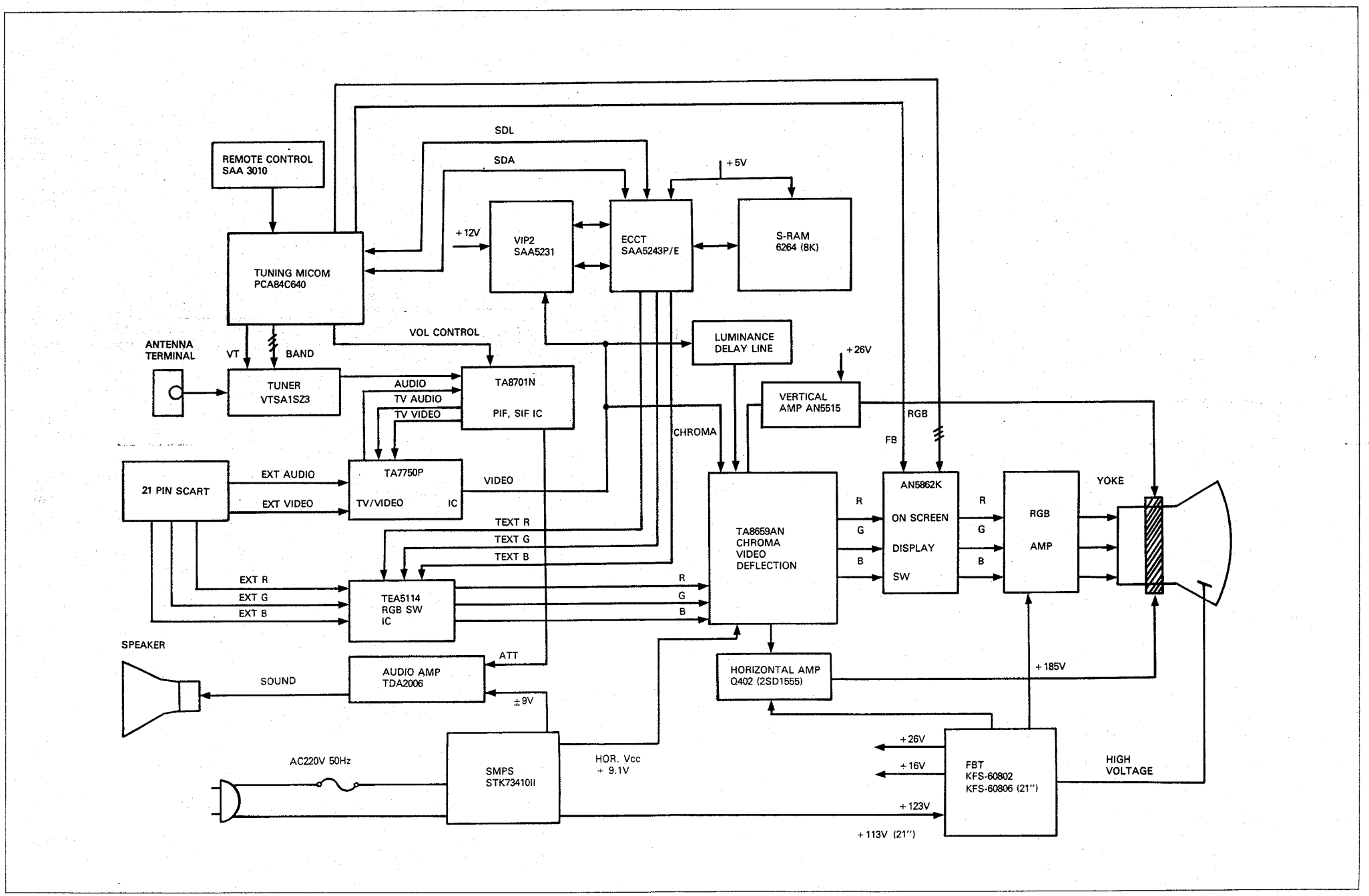
■ REMOTE CONTROL UNIT



***TV USE**
① POWER OFF BUTTON
② STATUS BUTTON
③ CHANNEL SELECT BUTTON
④ ONE, DUAL DIGIT
⑤ TV BUTTON
⑥ SLEEP BUTTON
⑦ PP BUTTON
⑧ AV BUTTON
⑨ MUTE BUTTON
⑩ CONTRAST UP/DOWN BUTTON
⑪ BRIGHTNESS UP/DOWN BUTTON
⑫ COLOUR UP/DOWN BUTTON
⑬ VOLUME UP/DOWN BUTTON
⑭ PROGRAM DOWN BUTTON
⑮ PROGRAM UP BUTTON

***TEXT USE**
② STATUS BUTTON
③ PAGE SELECT BUTTON
④ PAGE UP BUTTON
⑭ LIST/FLOF BUTTON
⑮ BROWSE BUTTON
⑯ REVEAL BUTTON
⑰ MIX BUTTON
⑱ CYAN BUTTON
⑲ GREEN BUTTON
⑳ RED BUTTON
㉑ YELLOW BUTTON
㉒ SUB CODE BUTTON
㉓ DOUBLE HEIGHT BUTTON
㉔ HOLD BUTTON
㉕ CANCEL BUTTON
㉖ INDEX BUTTON
㉗ PAGE DOWN BUTTON
㉘ TEXT BUTTON

BLOCK DIAGRAM



WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATIONAL PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

INSTALLATION AND SERVICE ADJUSTMENTS

GENERAL IMFORMATION

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore the receiver should operate normally and produce proper color and B/W pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the receiver is operated. This receiver is shipped completely in a cardboard carton. Carefully draw out the receiver from the carton and remove all packing materials.

Plug the power cord into a convenient 220 volts 50 Hz AC power outlet. Turn the receiver ON and adjust the FINE TUNING for best picture detail with the AFT switch in the OFF position. Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOR Controls to obtain a natural color B/W picture.

AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussed upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON. If the set is moved or placed in a different direction, the power switch must be switched off for at least 10 minutes in order for the automatic degaussing circuit to operate properly.

Should the chassis or parts of the cabinet become magnetized to cause poor color purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the receiver and slowly withdraw the coil to a distance of about 2m before disconnecting it from the AC source. If color shading still persists, perform the COLOR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures, as mentioned later.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. The +123 (+113: 21") volt power supply must be properly adjusted to insure the correct high voltage.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage should be below 25.5kv (21": 3kv)
4. Rotate the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 27.5kv (21": 29.0kv) under any conditions.

HORIZONTAL CENTRE ADJUSTMENT

1. Receive RETMA pattern signal.
2. Adjust R404 so that the horizontal centre of the picture may be coincident with the mechanical centre.

V-HEIGHT ADJUSTMENT

V-HEIGHT Control (R-303) on the MAIN Board changes the size of the picture of pattern, having an equal effect on the top and the bottom. Make a final adjustment to overscan the mask 2 cm at the top and the bottom.

FOCUS ADJUSTMENT

Adjust FOCUS Control on FBT for well defined scanning lines in the central area of the screen.

DELAYED R-F AGC ADJUSTMENT

1. Receive PAL COLOR BAR signal in the VHF high band.
2. Set the CONTRAST control to Max. the BRIGHTNESS control to provide adequate black and grey scales.
3. Maintain the fine tuning on the screen, and adjust R132 (AGC DELAY CONTROL VR.) in order that it may be located on the position which the picture noise disappear on the image.

COLOR AMPLITUDE AND PHASE ADJUSTMENT

1. Receive a PAL/DEM signal (Philips Model PM 5519).
2. Connect the probe of an oscilloscope to B-Y output.
3. Adjust L503 and R508 in order to make the waveform flat on the screen (Figure 1).
4. Receive a color bar signal instead of the DEM signal.
5. Adjust L503 to make B-Y output stable. (Figure 2)

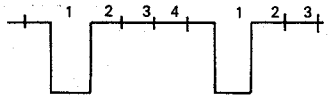


Figure 1

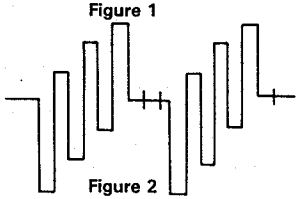


Figure 2

■ SECAM BELL FILTER ADJUSTMENT

1. Apply the SECAM Color Bar signals.
2. Connect the probe of oscilloscope to the Pin 18 of I501.
3. Adjust the BELL FILTER COIL (L502) for the flat level of Amplitude in each color bars waveform as Fig. 3-1.

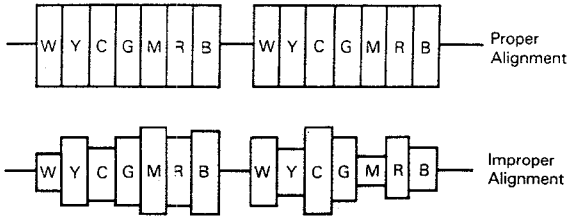


Fig. 3-1

■ SECAM IDENT COIL ADJUSTMENT

1. Apply the SECAM Color Bar signals.
2. Connect the digital voltimeter to the pin 23 of I501.
3. Adjust IDENT COIL (L505) for Maximum voltage.

■ SECAM B-Y R-Y DISCRIMINATOR COIL ADJUSTMENT

1. Apply the SECAM Color Bar signals.
2. Connect the probe of oscilloscope to the pin 62 of I501.
3. Adjust the B-Y discriminator Coil (L510) so that noncolor part and Horizontal blanking part are on the same level. (Fig. 3-2)
4. Connect the probe of oscilloscope to pin 60 of I501.
5. In the same manner, adjust R-Y Discriminator Coil (L504). (Fig. 3-3)

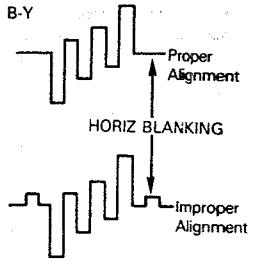


Fig. 3-2

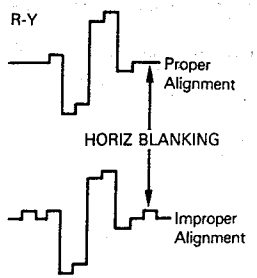


Fig. 3-3

WHITE BALANCE ADJUSTMENT

The purpose of this procedure is to optimize the picture tube to obtain the best black and white picture at all brightness levels while at the same time achieving maximum usable brightness. Normal RF AGC setting and purity adjustment must precede this procedure. This adjustment is to be made only after a warm-up of at least 15 minutes.

When the antenna is connected to the receiver, tune in a strong picture channel.

Rotate the Color control to maximum CCW position and misadjust PRE-SET tuning so that the receiver will not produce a color picture while the following adjustments are being performed.

1. Set the Green Drive (R515) and the Blue Drive (R505) controls to mid-position.
2. Set the Sub-Bright control (R222) to maximum.
3. Set the Bias controls (R502, R512, R522) and Mode controls (Contrast, Bright, Color) to minimum.
4. TV display change to Video display.
5. Connect a short clip lead between chassis ground and pin 4 of I301.
6. Rotate the screen Control to clockwise or anti-clockwise so as to obtain dim horizontal line of the color in red, green and blue.
7. Rotate the Red, Green and Blue Bias controls of the other colors (Which did not appear on the screen) clockwise, until a dim white line is obtained.
8. Rotate the screen control gradually anti-clockwise until the last horizontal line disappears on the screen.
9. Remove the short clip lead between chassis ground and pin 4 of I301.
10. Video display change to TV display.
11. Rotate the Sub-Bright control (R222) gradually anti-clockwise until the last Beam disappears on the screen.
12. Set the Contrast control and the Brightness control to maximum.
13. Set the two Drive controls (R505, R515) to obtain best white uniformity on the screen.
14. Rotate the Contrast and Bright controols until a dim raster is obtained.
15. Touch-up adjustment of the three Bias Controls to obtain best white uniformity on the screen.

CONVERGENCE ADJUSTMENTS

Note: Before attempting any convergence adjustments, the receiver should the warmed-up for at least fifteen minutes.

■ Centre Convergence Adjustment

1. Receive a crosshatch pattern from a color bar signal generator.
2. Adjust Controls for a well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 5) and superimpose red and blue vertical in the centre area of the screen. (See figure 6).
4. Turn both tabs at the same time, keeping the contrast angle to superimpose red and blue horizontal lines at the centre of the screen (See figure 6).
5. Adjust two tabs of the 6-Pole Magnets to superimpose red/blue line and green line. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.

■ Circumference Convergence Adjustment

1. Loosen the clampling screw of the deflection yoke to allow the yoke to tilt.
2. Put in a wedge temporarity as shown in figure 3. (Do not remove the cover paper on adhesive part of the wedge).
3. Tilt the front of the deflection yoke up or down the obtain the best convergence under the circumstance. (See figure 6) Push the mounted wedge into the space between the picture tube and the yoke to fix the yoke temporarily.
4. Put another wedge into the bottom space and remove the paper cover for adhesion.
5. Tilt front of the yoke right or left to obtain the best convergence under the circumstances. (See figure 6).
6. Keep the yoke position firm and put another wedge in one of the upper spaces. Remove cover paper and stick the wedge on the picture tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in the other upper spaces. Stick it on the picture tube to fix the yoke.
8. After fixing three wedges, recheck overall convergence. Tighteen the screw. Firmly to fix the yoke and check the yoke is firm.
9. Stick 3 adhesive tapes on wedges as shown in figure 4.

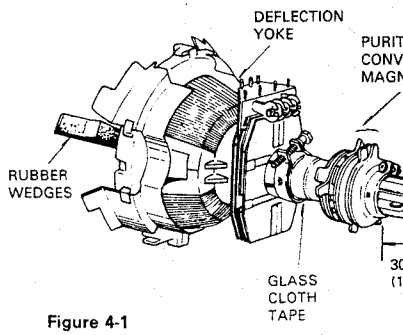


Figure 4-1

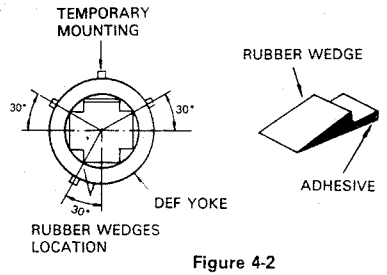
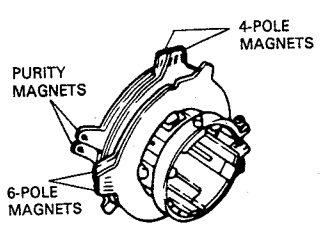
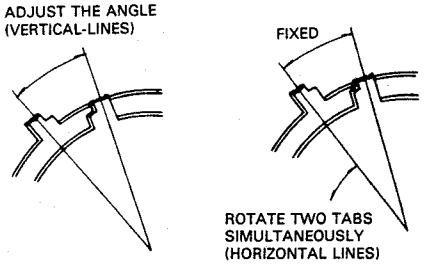


Figure 4-2

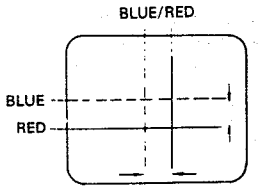


CONVERGENCE MAGNET ASSEMBLY

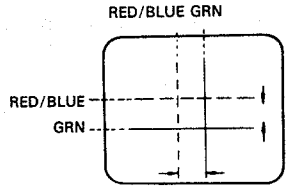


ADJUSTMENT OF MAGNETS

Figure 5

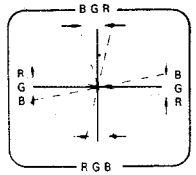


4-POLE MAGNETS MOVEMENT

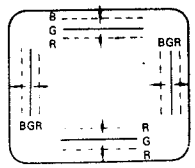


6-POLE MAGNETS MOVEMENT

Contre Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN)



INCLINE THE YOKE RIGHT (OR LEEFT)

Circumference Convergence by DEF. Yoke

Figure 6 Dot Movement Pattern

GENERAL ALIGNMENT INSTRUCTIONS

NOTE: THIS RECEIVER IS TRANSISTORIZED. SPECIAL CARE MUST BE TAKEN WHEN SERVICING. READ THE FOLLOWING NOTE BEFORE ATTEMPTING ALIGNMENT.

- Alignment requires exact procedures and should be undertaken only when necessary.
- Isolation transformer must be used to prevent shock hazard.
- The test equipment specified or its equivalent is required to perform the alignment properly. Use of equipment which does not meet requirements may result in improper alignment.
- Correct matching of equipment is essential. Failure to use proper matching will result in responses which cannot represent the true operation of the receiver.
- Use of excessive signal from a sweep generator can cause overloading of receiver circuit. Overloading should be avoided to obtain a true response curve.
  Insertion of markers from the marker generator should not cause distortion of the response.
- The AC Power line voltage should be kept at 220 volts while alignment is carried out.
- Do not attempt to connect or disconnect any wire while the receiver is in operation.
  Make sure the power cord is disconnected before replacing any part in the receiver.

TEST EQUIPMENTS

Digital voltmeter
Oscilloscope
Direct/Low-capacity probe
Color-Bar/Dot/Crosshatch generator
PIF sweep marker generator (for example, Nihon Tsushinki Model 4723)
Isolation transformer
Power supply

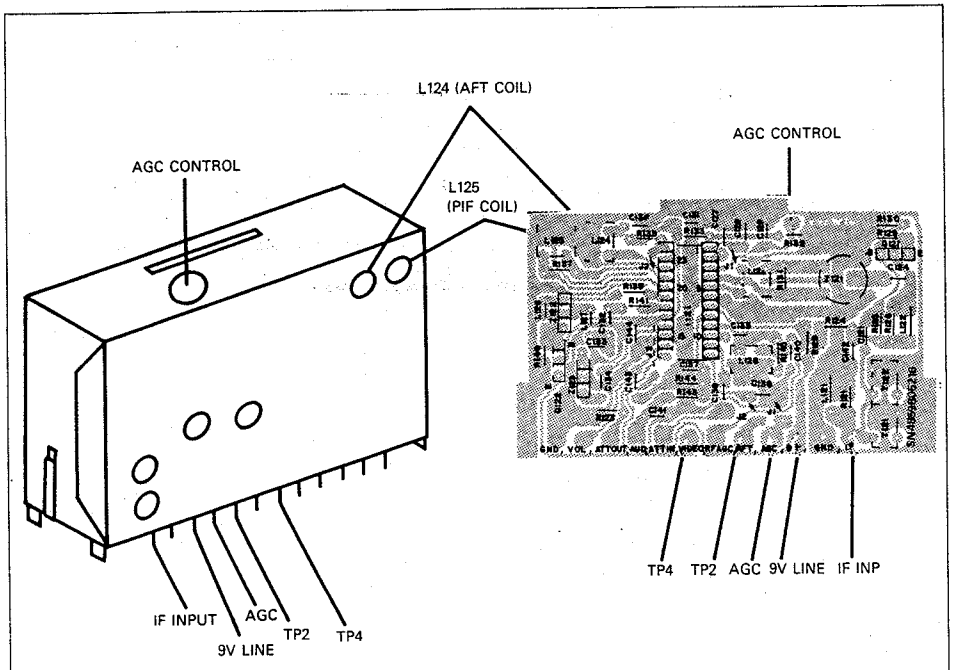


Figure 7-1 IF Module

■ PICTURE IF SWEEP ALIGNMENT AND AFT ALIGNMENT

- Refer to Figure 7, 8 and 9 for alignment points and test equipments connections.

1. Disconnected the IF Module From the Main PWB.
2. PRESET
   A) Oscilloscope
      a) Put the scale of X and Y of the oscilloscope to D.C level.
      b) Put the Mode SW. to CH2.
      c) Set the horizontal time to X-Y scale.
      d) Put the horizontal axis (X) to 1V/div. level in order to display all marker freq.
      e) Put the vertical axis (Y) to 0.5V/div. in PIF adj. and to 2V/div. in AFT adj.
   B) PIF SWEEP/MARKER FREQ. SETTING

BAND	31.9	33.4	34.47	36.0	38.9	40.4

3. Connect the "Output Terminal" of the sweep/marker generator to the I-F input on the IF Module.
4. Connect the "DET IN" with direct probe to TP4 on the IF Module.
5. Supply +9 volts bias to 9 volts line (B+) and 6 volts bias to terminal TP1 (AGC) on IF Module.
6. Set the AGC DELAY Control (R132) on IF PCB fully clockwise.
7. Proceed with the alignment steps following the chart below.

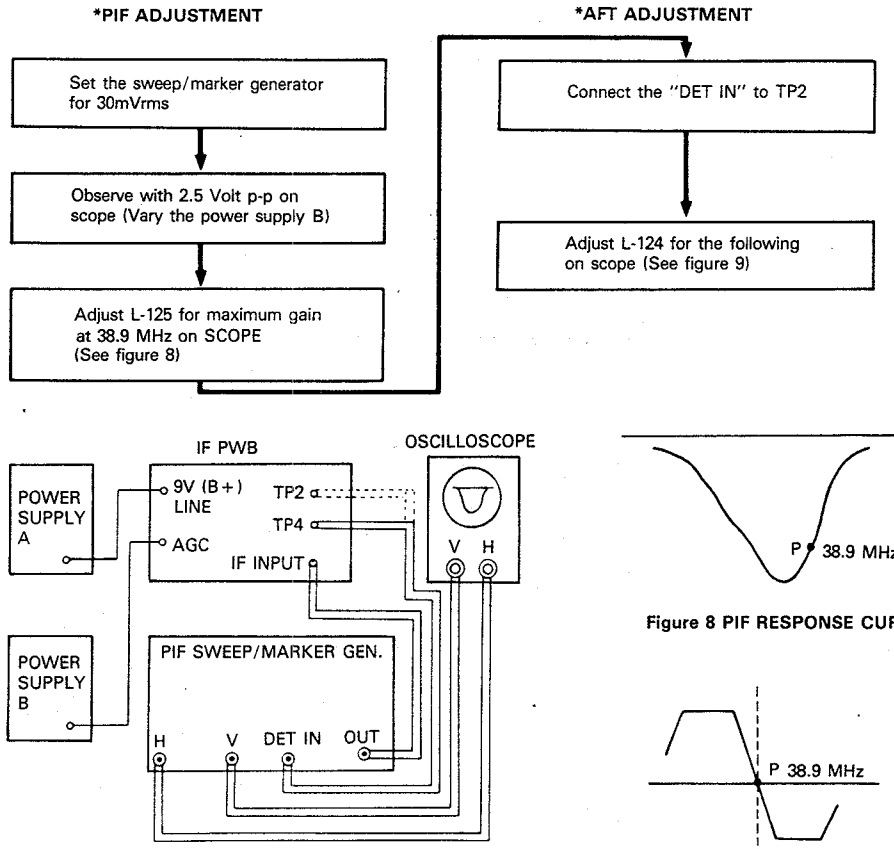


Figure 7-2 Picture I-F Sweep Alignment
*After completing the above steps, disconnect equipment
and adjust the AGC circuit.

Figure 8 PIF RESPONSE CURVE

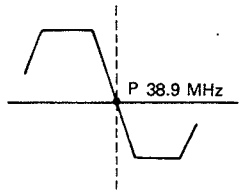


Figure 9 AFT RESPONSE CURVE

■ SIF ADJUSTMENT-IN THE IF PCB

1. ADJ. EQUIPMENT

1) FM Signal Generator
2) D.C Power Supply
3) Oscilloscope

2. PRESET & CONNECTIONS OF APPARATUS

A) PRESET

Switch FM/AM SIGNAL GEN. on and set the user's control panel as follows after it is warm up sufficiently.

a) MOD. SELECTOR: INT. FM
b) INT. MOD. FREQ.: 400Hz
c) FM METER RANGE: 25KHz
d) SET CARRIER: 15KHz
e) SOUND CARRIER FREQ.: 5.5 MHz
f) OUTPUT LEVEL: 90dB

B) CONNECTIONS (Refer to Fig. 13)

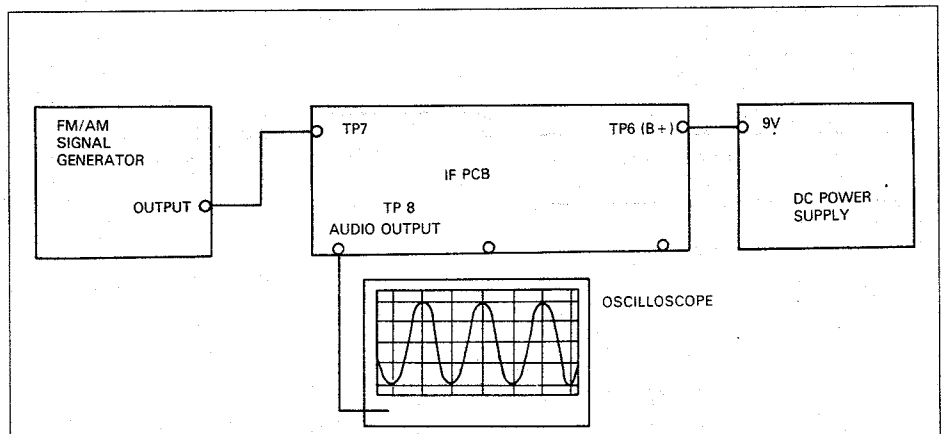


Figure 13 Connection of SIF Adjustment

3. ADJUSTMENT OF SIF

1) Connect the output of FM/AM SIGNAL GEN. to TP7.
2) Supply 9V D.C (B+) to TP6.
3) Adjust L128 to obtain a maximum amplitude on the waveform to TP8 (AUDIO OUTPUT SIGNAL).

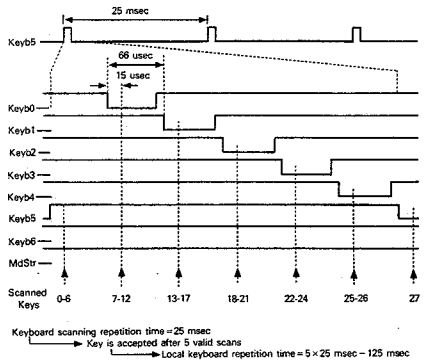
■ IC OPERATION DESCRIPTION

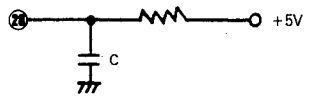
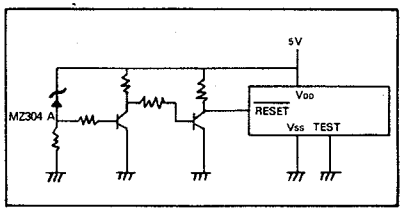
1. PCA84C640

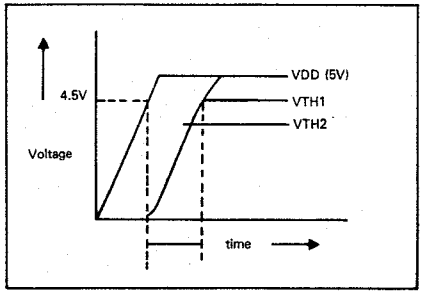
(1). Description of Terminals

Pin No.	Symbol	Name	Function Description
1	Vt	Tuning Voltage Control Output	• The Vt output is the pulse width modulated output of a 14 bit digital to analogue convertor which is split-up in 7 bits for coarse adjustment and another 7 bits for time adjustment • The basic period of the tuning output signal is $2^{14} \times fxtal/3 = 4915.2\mu sec$ (fxtal = 10MHz).
2	VOL	Volume Control Output	• Sound volume control output terminal. • Output pulse width modulated waveform in 64 levels in accordance with 6-bit latch data (active "H"). • At the minimum value of VOL, the output waveform becomes "ALL L". After that, whenever the VOL (+) key is pressed, the "H" pulse is incremented by 1. At the maximum value of VOL, the period of "H" becomes 63/64 (duty: 63/64) • In the following operations, the mute state (minimum value) occurs for a specific time. (1) Program selection operation. (2) Port output switching. • Using the mute key operation, the sound volume output state and mute state can be switched.
3	BRI	Brightness Control Output	• Outputs the pulse width modulated signal in 64 levels in accordance with 6-bit latch data (active "H").
4	COL	Colour Control Output	
5	CON	Contrast Control Output	
6	BAL	Balance Control Output	Not used.
7 8 10	BL BH BU	Band Control Output	• There are control band signal output terminals for a tuner. • Assignment for bands is as follows:
9	AFC	Comparison Voltage Input	• Comparison voltage input terminal connected to built-in comparator. • Input AFC Signal from TV with level conversion (0 to Vdd). • The results of the comparison are used when the autosearch and digital AFT (described later) works.
11	VTR	VTR Time Constant Control Output	• This pin controls the VTR time constant of the first PLL in the horizontal synchronization circuit of the TV receiver. • This chassis connected to GND.

Band	BL	BH	BU
VHF-L	H	L	L
VHF-H	L	H	L
UHF	L	L	H

Pin No.	Symbol	Name	Function Description
12	AV	TV/VIDEO Selection Output	• Output pin AV defines whether internal audio/video signals (TV) or external signal from peripheral TV connector are selected. • When output state becomes "H", the TV mode is set. When output state becomes "L", the AV mode is set. • It always start from the TV mode.
13 14 15 16 17 18 19	P00-P06	Local Keyboard Control	• Input and output pin P00 to P06 are used to scan to local keyboard matrix. • The keyboard is scanned every 25mSec; for timing see as follows.  **Figure 10-1 Local Keyboard Scanning** • If a keypress is detected for 5 periods, it is recognized as a valid key command. • The repetition of the local keyboard is 125mSec, which is almost equal to the repetition time of the remote control transmitter.
20	MDSTR	System mode Strobe Output	• This pin is used to scan the various system options. • An active low signal is generated at the very first switch-on ("COLD START"). • Local keyboard control inputs P00 to P06 are read first; all keys on the local keyboard must be released, otherwise it will wait until they are. • The pins that have a diode connection to MDSTR are read back as 0, the pins that do not have such diode connection are read back as a logic 1.
21	GND	GND Terminal	• Connected to the 0V power supply.
22 23 24 25	R G B BLANK	R.G.B Output Blank Output	• Outputs R.G and B deliver the colour components for the OSD while output BK is used as a fast blanking signal. • The output polarity of the R.G.B and BK terminals are active "H".
26	H. SYNC	Horizontal Synchronous Signal Input	• Input terminal for CRT display horizontal synchronous signal. • Input rectangular pulses whose amplitude is in the range from 0 to 5V. • The input polarity is active "H".

Pin No.	Symbol	Name	Function Description
27	V. SYNC	Vertical Synchronous Signal Input	• Input terminal for CRT Display vertical synchronous signal. • Input rectangular pulses whose amplitude is in the range frame 0 to 5V. • The signal state should be active for the time more than that required for three scanning lines. • The input polarity is active "H".
28	DOSC	OSD Oscillator Input	• Input DOSC has to be connected to an external RC network which controls the oscillation frequency of the interal OSD pixel oscillator.  **Figure 10-2 The External RC Oscillator**
29	IDENT	Video Recognition Input Signal	• Input terminal of image synchronous signal necessary for auto search and AFT operation. • In the case of the determination of the level signal synchronization, the signal state ("H" or "L") which is input at this terminal is determined every 4ms. "H" .....Presence of synchronization "L" .....Absence of synchronization
30	TEST	Test Input	• Input TEST has to be connected to GND.
31 32	XTAL 1 XTAL 2	Microcontroller Oscillator Control	• The XTAL 1 and XTAL 2 are used to control the on-chip oscillator of the μ-controller. • XTAL 1 is the input terminal and XTAL 2 the output terminal. • All internal timing of the μ-controller (except for the OSD part) is derived from this oscillator. • The oscillator frequency has to be 10MHz.
33	RESET	Reset Input/Output	• The circuit shown in figure 10-3 provided to the reset terminal allows the reset function to work when the power is turned ON. In addition, a schmitt circuit is accommodated in reset terminal. The reset state is canceted when the reset terminal voltage "Vdd" exceeds the thershold voltage "VTh1". However once the CPU operation is canceled, unless "V" drops to the threshold voltage "VTh2" the reset function does not work again. In addition to cause the reset function to securely work when the power is turned on it is necessary to set the time to after the power voltage Vdd exceeds 4.5V figure 10-4. When the reset funcktion works, the program counter in CPU is initialized.  **Figure 10-3 System Reset Circuit**

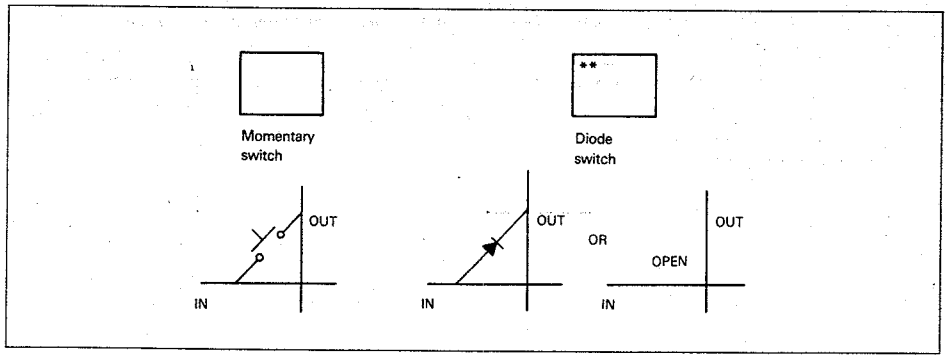
Pin No.	Symbol	Name	Function Description
			 **Figure 10-4 Relation Between Voltage and Reset Function.** • After the reset mode is released, each terminal is set to the initial state and the CPU works from the initial state.
34	SNDI	Sound Mode Input	• This pin is used to define whether the system is decoding a dual language transmission or a mono/stereo transmission. • This chassis is not used because of a the mono TV receiver.
35	IR	Remote Control Signal Input	• Remote control signal input terminal.
36	SNDO	Sound Mode Select Output	• This pin is used to define what kind of sound system is controlling. • The selection spatial and pseudo stereo sound effect is only possible in a full stereo system. • This chassis connected to GND because of the mono TV receiver.
37	EFFECT	Pseodo/Spatial Stereo Control Output	• This pin is used to control the spatial, pseodo stereo or only other sound effect in a stereo sound. • After power-on reset of the μ-controller pin EFFECT is tested to define whether the fifth analoge control DAC is to be used or not.
38	SYSTEM	System Standard Control Output	• This pin is used to control the sound and IF part for two different TV transmission standard.
39 40	SCL SDA	I^2C-bus Control Input/ Output	• Pins SCL and SDA are respectively the data and clock wire of the multi-master two-wire bidirection I^2C-bus control bus. • If a transmission does not succeed the controller will retrq it for up to 5 times. If the bus is occupied for longer than 1.18 seconds the μ-controller will generate bursts of nine clock pulses with intervals of 1.18 seconds until bus is free again.
41	POWER	STAND BY ON/OFF Control	• The switch-mode power supply is controlled. "L" .....Power ON "H" .....Power OFF
42	Vcc	Power Supply Terminal	• Connected to the 5V power supply.

(2) Key

A) Key Assignemnt

	P00 (13)	P01 (14)	P02 (15)	P03 (16)	P04 (17)	P05 (18)	P06 (19)
P04 (17)	F/T (+)	F/T (−)	SLEEP	AUTO SEARCH UP			
P05 (18)	PRO (+)	PRO (−)					
P06 (19)	ANA (+)	ANA (−)					
GND	PP	ANA SEL	STORE	CLEAR			
HDSTR (20)	** OSD SELECTOR	** OSD BACK GROUND SELECTOR		** TUNING TIME SELECTOR	** TUNING TIME SELECTOR		** AFT FOLLOWING ON/OFF

B) Key Type



2. TA8659AN

(1). Description of Terminals

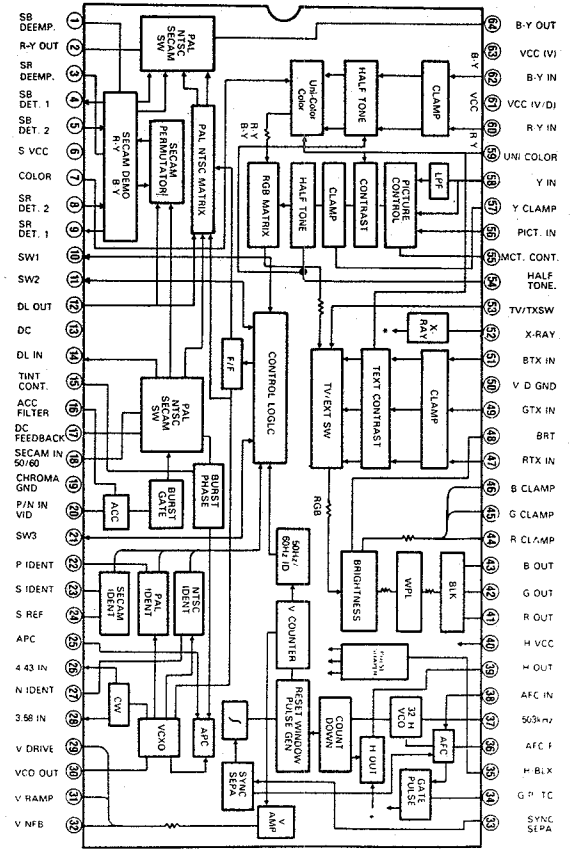
Pin No.	Symbol	Name	Function Description
1 3	SCM DEEMP	SECAM de-emphasis	Connect a capacitor to GND for SECAM de-emphasis. #1: B-Y #3: R-Y
2 64	R-Y OUT B-Y OUT	Color differential signal outputs	Load resistor of 8.2 kΩ is connected to GND.
4 5	SB DET	SECAM B-Y detector	A 4.250 MHz tuned tank circuit for SECAM B-Y detector is connected.
6	S VCC	VCC for chroma stage	The typical supply voltage is 12.0V. By-pass capacitance is connected to terminal 19.
7	COLOR	Color control	Color saturation increases when the terminal voltage of #7 increase. When the color killer circuit operates, the terminal voltage of #7 turns to low.
9 8	SR DET1 SR DET2	SECAM R-Y detector	A 4.406 MHz tuned tank circuit for SECAM R-Y detector is connected.
11 21	SW2 SW3	System logic. I/O	This terminal is an output of system identification logic circuit and also is an input of Manual Select Mode.
12	DL OUT	Delayed chroma signal input	1H delayed chroma signal input for PAL/SECAM. The signal phase shift between terminal #14 and terminal #12 should be less than 5 deg. The signal loss of the 1H delay line should be 16 dB
13	DC	By-pass	An external capacitor for a bias circuit is connected.
14	DL IN	Delay line driver output	The PAL/SECAM choma signal output for a 1H delay line. Connect a load resistor of 2 kΩ to GND.
15	TINT CONT	Tint control (NTSC Mode)	A phase of burst signal is controlled by this terminal in the NTSC mode.
16	ACC FILTER	ACC filter	An external capacitor for ACC filter is connected.
17	DC FEED-BACK	By-pass filter	An external by-pass capacitor for a bias circuit is connected.
18	SECAM IN 50/60	SECAM signal input	SECAM chroma signal is led to this terminal through a Bell filter circuit. Terminal DC voltage is changed by the 50/60 identification logic output. 7.4V for 60 Hz 4.4V for 50 Hz This identification output is useful for changing a vertical size and shifting a horizontal position on the screen.
19	CHROMA GND	CHROMA GND	GND of the chroma stage.
20	P/N IN VID	PAL/NTSC chroma signal input	PAL/NTSC chroma signal is led to this terminal through band pass filter circuit. The SECAM identification mode is determined by this terminal DC voltage. Open: Line Ident. 15 kΩ to GND: Line + Fram Ident.

Pin No.	Symbol	Name	Function Description
22 23 27	P IDENT S IDENT N IDENT	IDENT filter	#22 PAL ident filter #23 SECAM ident filter #27 NTSC ident filter
24	S REF	SECAM ident discriminator	A 4.328 MHz tuned tank circuit for SECAM identification is connected. Adjust tank coil so that the recovered DC voltage at terminal 23 is maximum value for 4.328 MHz.
25	APC	APC filter	APC filter time constant is connected. When the kiler operates, automatic searching circuits operate to widen the pull-in range of the APC circuit. The external time constant also determines the searching speed.
26	4.43 IN	4.43 MHz X'tal IN	4.43 MHz X'tal is connected between terminal 26 and terminal 30. No adjustment is required.
28	3.58 IN	3.58 MHz X'tal IN	3.58 MHz X'tal is connected between terminal 28 and terminal 30. During a color system detection, the X'tals are switched at every 4 APC sweep period. When 3.58 MHz Mode is not needed, 5.6 kΩ is connected between terminal 28 to GND.
29	V DRIVE	Vertical output	Output terminal of vertical driver.
30	VCO OUT	X'tal drive	
31	V RAMP	Ramp generator	A vertical sawtooth-wave generater circuit is composed of a ramp capacitor, a zener diode which determines sawtooth starting voltage, and a discharge resistor.
32	V NFB	Vertical NFB	AC and DC negative feedback terminal. The waveform of terminal #32 is equivalent to that of terminal #31 according to the internal operational amplifier.
33	SYNC SEPA	Sync sepa. input	Input terminal of emitter-time constant-type sync separator.
34	GP. TC	Gate Pulse Filter	An external filter for a gate pulse is connected.
35	H BLK	Flyback pulse input, Sync pulse output	Flyback pulse is used as a horizontal blanking of color differential signal output (#2, #64), color primary signal output (#41, #42, #43), and 1H delay line output (#14), and also used as a masking pulse for a gate pulse generator, PAL matrix switching, and a SECAM permutator switching. This terminal is also the output of sync signal. During sync period, the terminal voltage of #35 turns to high.
36	AFC F	AFC filter	
37	503 KHz	32 fH VCO	Adjustment-free, 32 fH Voltage-Controlled Oscillator. A ceramic resonator is connected. A wide pull-in range covers both 15.625 kHz and 15.734 kHz of horizontal frequency.

Pin No.	Symbol	Name	Function Description
38	AFC IN	Integrated flyback pulse input	A sawtooth-type horizontal AFC circuit is composed. #38 is an input terminal of integrated flyback pulse (sawtooth). #36 is an AFC filter terminal for 32 fH VCO. A time constant for integration of flyback pulse should be switched so that a screen position is equivalent for 15.734 kHz and 15.625 kHz of horizontal frequency.
39	H OUT	Horizontal drive output	An emitter follower output of horizontal predriver. An external load resister is required.
40	H VCC	H. VCC	Supply terminal for a horizontal deflection circuit. Recommended supply voltage is 9.0V. (9.0V zener diode is required.) A by-pass capacitance is connected to terminal 50.
41 42 43	R OUT G OUT B OUT	R OUT G OUT B OUT	Color primary signal output
44 45 46	R CLAMP G CLAMP B CLAMP	Clamp capacitor	Clamp capacitor for DC restoration is connected.
47 49 51	RTX IN GTX IN BTX IN	R INPUT G INPUT B INPUT	External RGB signal input. An input decoupling capacitor is used as a clamp capacitor. Input signal level is 0.7 Vp-p.
48	BRT	Brightness control	
50	V/D GND	GROUND	GND for video circuit and deflection circuit.
52	X-RAY	X-ray protector	The input terminal of the X-ray protector. #39 Hor. drive terminal turns to low when the input voltage of this terminal exceeds the specified threshold voltage. (1.3V typ.)
53	TV/TX SW	EXT/TV switching signal input	Fast blanking pulse is acceptable. The threshold level is 1.0V typ.
54	HALF TONE	Half-tone/Full-tone switching signal input	When a half-tone circuit is active, the TV video signal amplitude becomes smaller the nominal level. WPS (White peak supress) switch. This terminal also switches the white peak supress circuits. When this circuit is active, in case the RGB output voltage becomes higher than 7.5V, the contrast control terminal voltage is lowered by the internal open collector circuit. Time constant is determined by external capacitance and variable resistor value at #59.
55	PICT. CONT.	Picture sharpness control/mute switch	When #55 voltage becomes lower than 0.7V, the mute function operates. The brightness control circuits become the same condition as when 3V is applied at #48, EXT/TV switch turns to TV mode, and the video signal and the color differential signal are cut.
56	PICT. IN		Second-order differntial video signal inputt.
57	Y CLAMP	Pedestal clamp	A terminal for a pedestal clamp capacitor.
58	Y IN	Video input	A video signal of sync negative should be applied.

Pin No.	Symbol	Name	Function Description
59	UNI COLOR		TV contrast control with uni-color control. Text contrast control. Video gain and color gain are controlled simultaneously. The typical gain control range is −20 dB.
60 62	R-Y IN B-Y IN	R-Y INPUT B-Y INPUT	Color differntial signal input. The decoupling capacitor is used as a clamp capacitor.
61	VCC (V/D)		VCC for video & vertical deflection stage. (12V) By-pass capacitance is connected to #50.
63	VCC (V)		VCC for RGB output stage. (12V) By-pass capacitance is connected to #50.

(2) BLOCK DIAGRAM

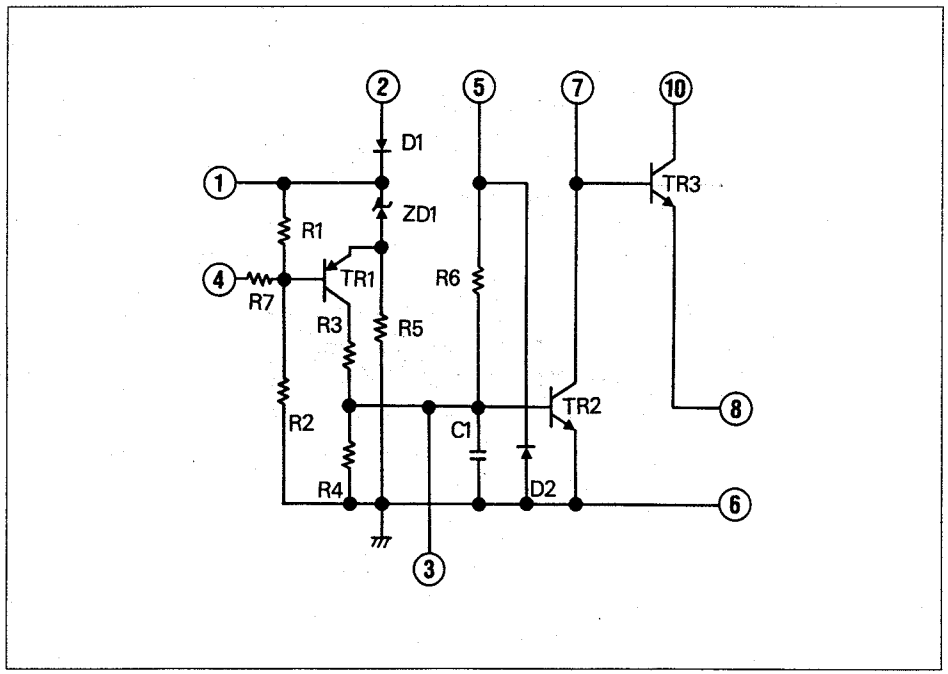


3. STK73410II

(1) Case Outline: 9-Pin.
(2) Function: OFF-LINE. Switching Regulator.
(3) Application: Voltage Regulator for Color TV/VTR use.
(4) Features: Self-Oscillation type.
(5) Absolute maximum ratings at TA = 25°C

ITEM	SYMBOL	RATED LEVEL	UNIT
AC Input Voltage	V AC	0 TO 280	V RMS
Maximum output power	WO MAX	100	W
Operating ambient temperature	T OP	−10 TO +65	°C
Storage ambient temperature	T STG	−30 TO +105	°C
Operating case temperature	TC MAX	105	°C
Thermal resistance	J-C	1.3	°C/W
Junction Temperature	TJ MAX	150	°C

(6) Internal equivalent circuit



4. TDA 2006

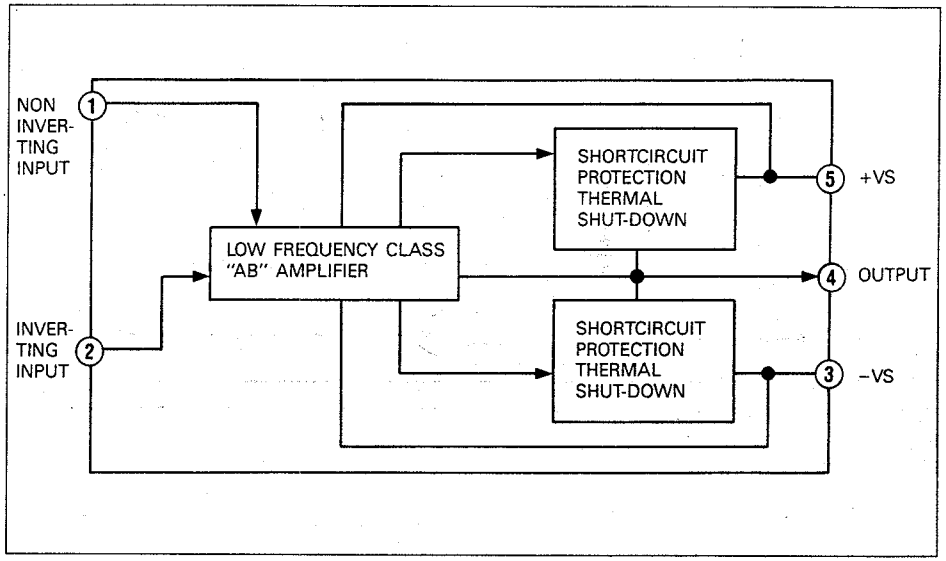
(1) Audio amplifier

The TDA 2006 is a monolithic integrated circuit in pentawatt package intended for use as a low frequency class "AB" amplifier. At ±9V, D = 10% typically it provides 2W output power ON a 8 ohm load, the TDA 2006 provides high output current and has very low harmonic and cross over distortion. Further the device incorporates an original (and patented) short circuit protection system comprising an arrangement for automatically limiting the dissipeated power so as to keep the working point of the output transistors within their safe operating area. A conventional thermal shutdown system is also included. The TDA 2006 is pin to pin equivalent to the TDA 2030.

(2) Description of terminals

PIN NO	NAME	FUNCTION DESCRIPTION
1	Non inverting input	Audio input from ATT out terminal of IF module.
2	Inverting input	Feedback input from pin 4 of IC602.
3	−VS	Supply voltage. (−9V)
4	Output	Typically output voltage provides 2W output power ON 8 ohm load.
5	+VS	Supply voltage. (+9V)

(3) Internal block diagram



5. TA8701N

(1) Video and sound IF for TV set function

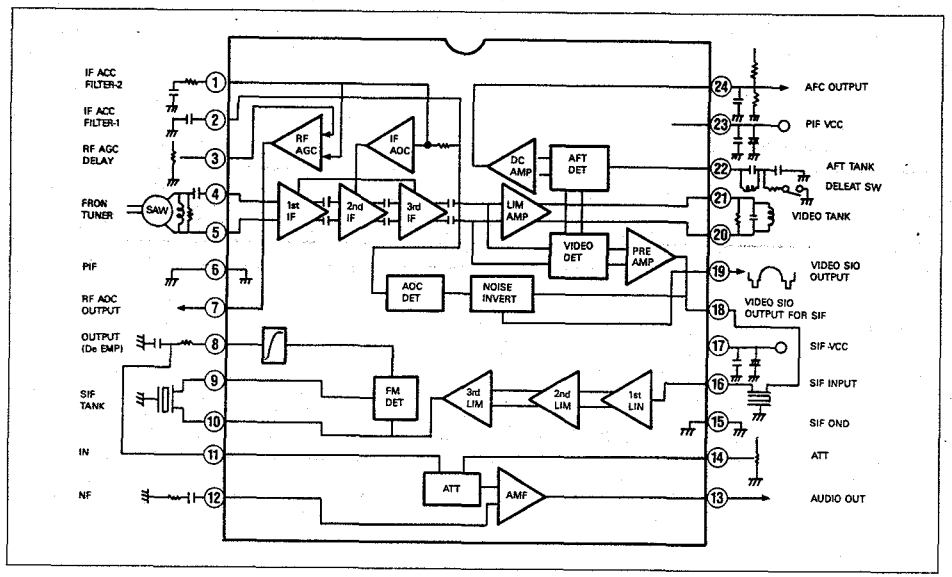
PIF

- Fast response AGC (peak) with dual size constants
- Single AFT output with defeat
- Reverse RF AGC
- Black/White noise inverting circuit SIF

SIF

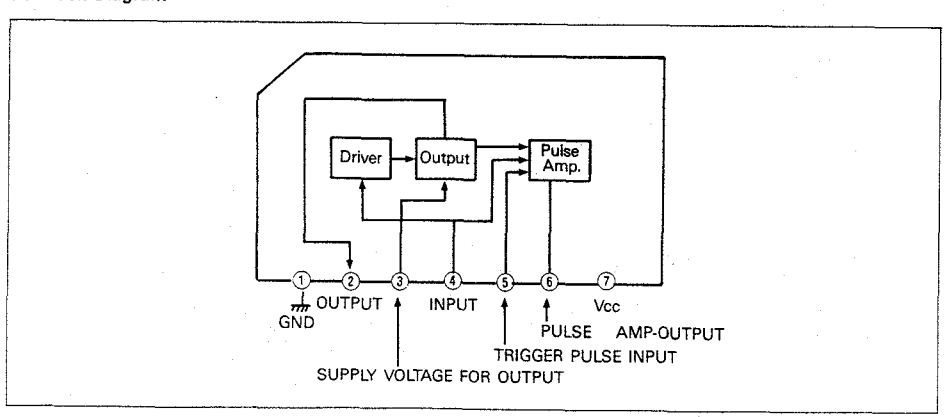
- Quadrature detector
- DC ATT control
- NF Audio AMP.

(2) Block Diagram



6. AN5515

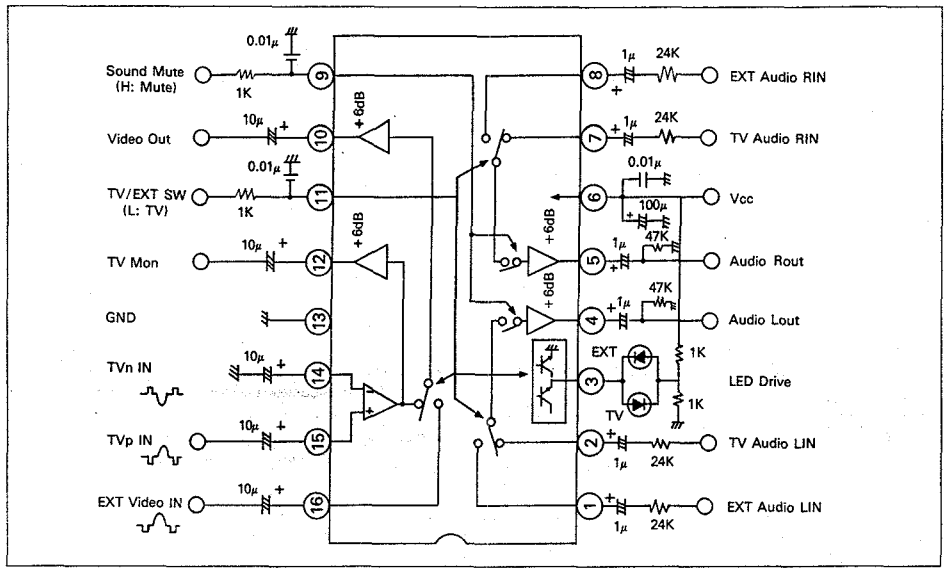
(1) Block Diagram



7. TA7750P

(1) This IC combines a two inputs video signal switch and two channel two input audio signal switches in 16 leads Dip package.

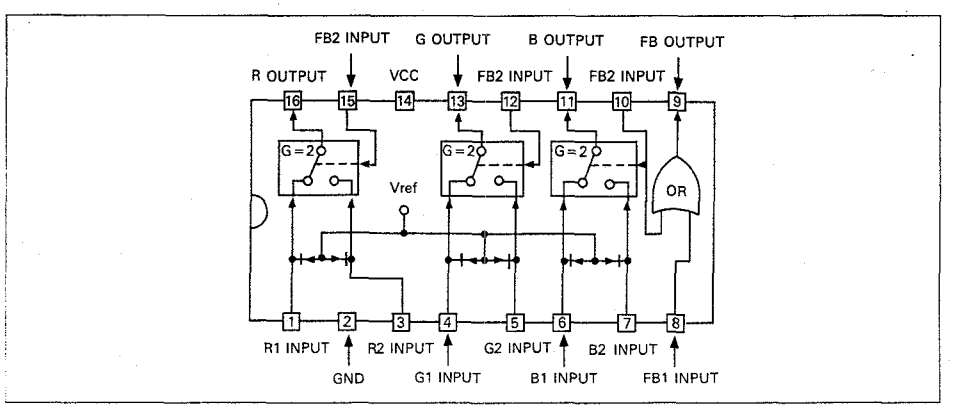
(2) Block Diagram



8. TEA5114A

(1) RGB Switching Circuit

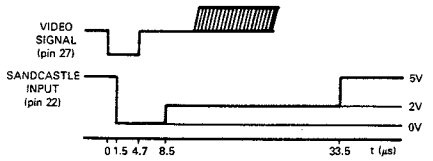
(2) Block Diagram



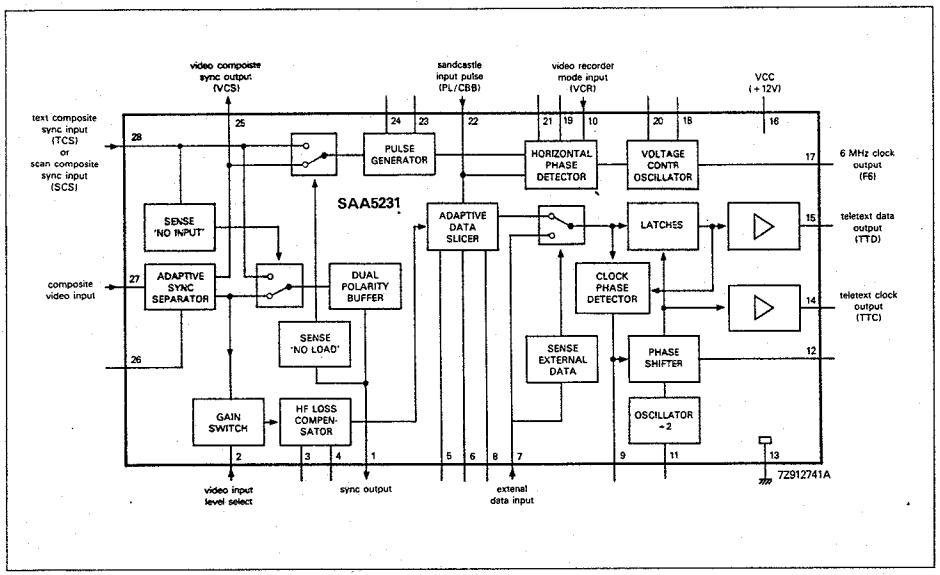
9. SAA5231

(1) Function of Terminals

Pin No.	Symbol	Name	Function Description
1	SYNC	SYNC Output to TV	• Output with dual polarity buffer, a load resistor to 0V or +12V selects positive-going or negative-going syncs.
2	VILS	Video Input Level Select	• When this pin is LOW, a 1V video input level is selected. • When the pin is not connected it floats HIGH selectig a 2.5V video input level.
3	HF	HF Filter	• The video signal for the h.f.-loss compensator is filtered by a 15pF capacitor connected to this pin.
4	ST	Store h.f.	• The h.f. amplitude is stored by a 1nF capacitor connected to this pin.
5	ST/AM	Store Amplitude	• The amplitude for the adaptive data slicer is stored by a 470pF capacitor connected to this pin.
6	SZL	Store Zero Level	• The zero level for the adaptive data slicer is stored by a 22nF capacitor connected to this pin.
7	Ex. DATA	External Data Input	• Current input for sliced teletext data from extermal device. • Active HIGH level (current), low impedonce input.
9	S/P	Store Phase	• The output signal from the clock phase detector is stored by a 100pF capaciton connected to this pin.
10	VCR	Video Tape Recorden Mode	• Signal input to command PLL into short time constant mode.
11	XTAL	Grystal	• A 13.85 MHz crystal, 2× data rate, connected in series with a 15pF capacitor is applied via this pin to the osallator and divide-by-two to provide the 6.9375 MHz clock signal.
12	CLX FLT	Clcok Filter	• A filter for the 6.9375 MHz cbck signal is connected to this pin.
13	GND	Ground	• Connected to 0V power supply
14	TTC	Teletext Clock Output	• Clock output for CCT (Compute Controlled Teletext.)
15	TTD	Teletext Data Output	• Data output for CCT.
16	Vcc	Supply Voltage	• Connected to +12V power supply
17	F6	Clcok Output	• 6 MHz clock output of timing and sandcastle generation in CCT.
18	6 MHz	Oscillator Output	• A series resonant circuit is connected between this pin and pin 20 to control the nominal frequency of the VCO.

Pin No.	Symbol	Name	Function Description
19	F/2	Filter 2	• A filter with a short time constant is connected to this pin for the horizontal phase detector. It is used in the video recorder mode and while the loop is locking up.
20	CSC IN	Oscillator Input	• See pin 18
21	F/1	Filter 1	• A filter with a long time constant is connected to this pin for the norizontal phase detector.
22	PL/CBB	Sandcastle Input Pulse	• This pin accepts a sandcastle waveform, which is formed from PL and CBB from the CTT. • Signal timing is shown in Fig. 10-5.  **(Figure 10-5) Sandcastle wave form and timing.**
23	P/TR	Pulse Timing Resistor	• The current for the pulse generator is determined by a 68KΩ resistor connected to this pin.
24	P/TC	Pulse Timing Capacitor	• The timing of the pulse generator is determined by a 220pF capacitor connected to this pin.
25	VCS	Video Composite Sync Output	• This output signal is for CCT.
26	BL	Block Level	• The black level for the adaptive syne separator is stored by a 68nF capacitor connected to this pin.
27	CVS	Composite Video Input	• The composite video signal is input via a 2.2uF clamping capacitor to the adaptive sync separator.
28	TCS/SCS	Txt Composite Sync Input/Scan Composite Sync Input	• TCS is input from CCT or SCS from external sync circuit. SCS is expected when there is no load resistor at pin 1. • If pin 28 is not connected the sync output on pin I will be the composite video input at pin 27, internally buffered.

(2) Block Diagram

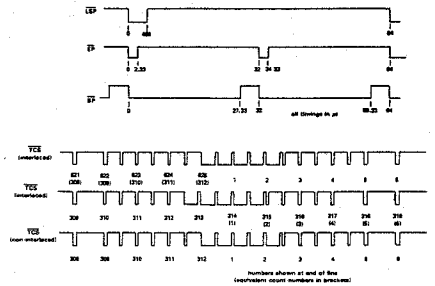


10. SAA5243

(1) Function of Terminals

Pin No.	Symbol	Name	Function Description
1	Vdd	Power Supply	• Connected to +5V power supply.
2 3 40	A11 A12 A10	Chapter Address	• Three outputs that select which 1K byte chapter of external RAM is being accessed for any read or write cycle.
4	OE	Output Enable	• Active low output signal used to coontrol the reading of the external RAM. • It ocurrs continuously at a 1MHz rate.
5	WE	Write Enable	• Active low output signal used to control the writing of data to the external RAM. • It ocurrs for a valid write cycle only and is interloeaved with the road cycle.
6	TTD	Teletext Data	• Input from the SAA5231 Video Input Processor (Vip2). • It is clamped to Vss for 4 to 8 μS of each TV Line to maintain the correct DC level following the external AC oupling.

Pin No.	Symbol	Name	Function Description
7	TTC	Teletext Clock	• 6.9375 MHz clock input from the SAA5231. • It is internally AC coupled to an active clamp input buffer.
8	ODD/EVEN	Odd/Even	• For internated mode, the output changes once per field at 2μS before the end of line 311 (624). • The output is high for even fields and low for odd fields.
9	F6	Character Display Clock	• 6 MHz clock input from the SAA5231. • It is internally AC coupled to an active clamp input buffer.
10	VCS	Video Composite Sync	• Input from the SAA5231 derived from the incoming video signal. • Sync pulse are active high.
11	SAND	Sand castle	• 3-level sandcastle output to the SAA5231 containing the phase locking and colour burst blanking information.
12	TCS/SCS	Text Composite Sync/Scan Composite Sync	• As an output an active low composite sync waveform (TCS) with interlaced or non-interlaced format (see Fig. 10-6) which is fed to the SAA5231 to drive the display time base. • Alternatively this pin can act as an input for an active low composite sync waveform (SCS) to 'Slave' the display timing circuits.

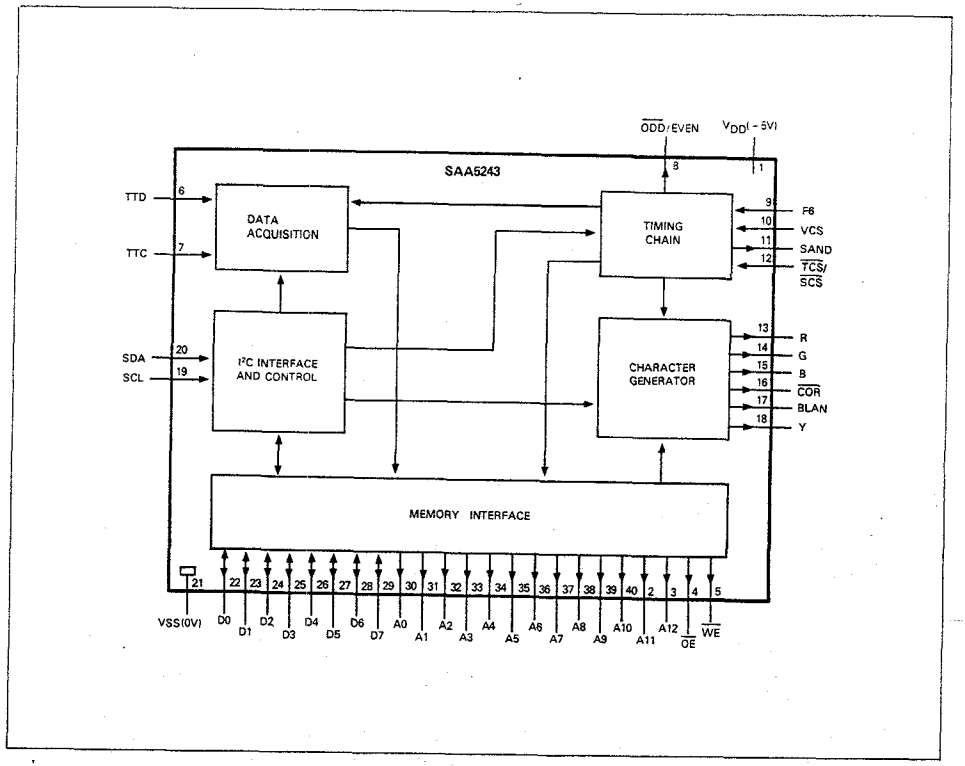


Line sync pulsed ($\overline{LSP}$), equalizing pulses ($\overline{EP}$) and board pulse ($\overline{BP}$) are combined to provide the text composite sync waveform ($\overline{TCS}$) as shown. All timings measured from falling edge of $\overline{LSP}$ with a tolerance of ± 100 ns.

Figure 10-6. Composite Sync Waveform

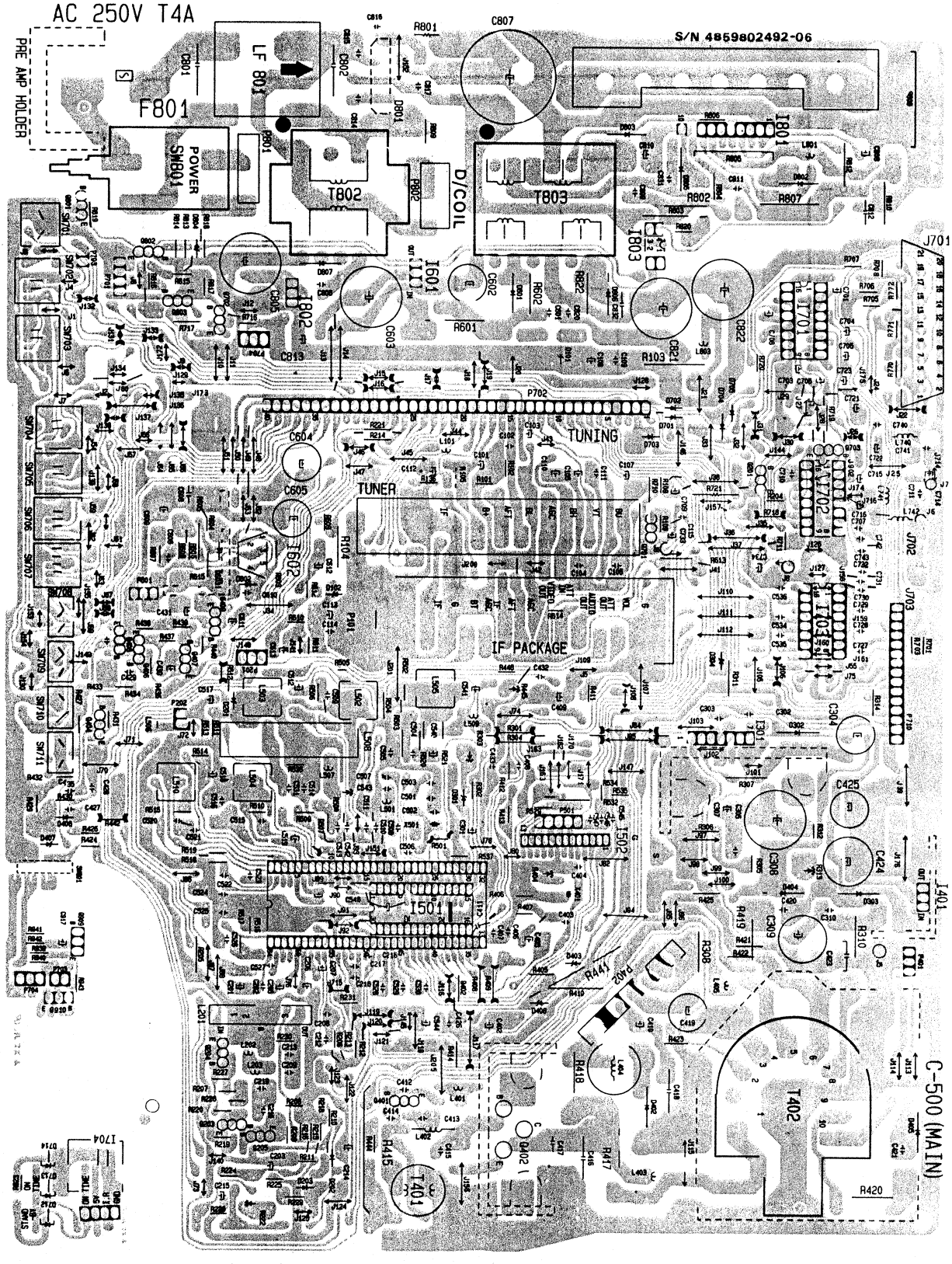
Pin No.	Symbol	Name	Function Description
13 14 15	R G B	RED GREEN BLUE	• Three open drain outputs are the character video signals to the TV display circuits. • They are active high and contain character and background information.
16	COR	Contrast Reduction	• Open drain, active low output which allows selective contrast reduction of the TV picture to enhance a mixed mode display.
17	BLAN	Blanking	• Open drain, active low output which allows selective contrast reduction of the TV picture to enhance a mixed mode display.
18	Y	Character Foreground	• Open drain, active high video output signal containing all the foreground information displayed on the TV screen (eq. for driving a display printer).
19	SCL	Serial Clock	• Input signal which is the I²C-hus clock from the μ-controller.
20	SDA	Serial Data	• It is the I²C-bus data line • It is an input/output function with an open drain output
21	Vss	Ground	• Connected to 0V power supply.
22 29	D0-D7.	8 Ram Data Line	• 3-state input/output pins which carry the data bytes to and from the external RAM.
30 39	A0 ~ A9	RAM Address	• 10 output signals that determine which byte location within 1K byte chapter of external RAM is accessed for any read or write cycle.

(2) Block Diagram

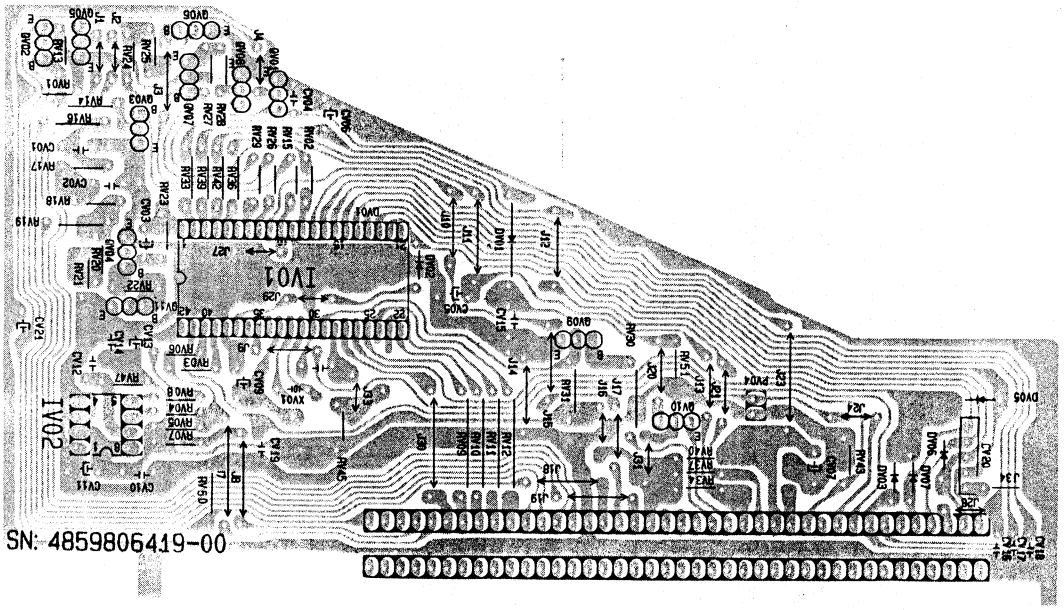


PRINTED CIRCUIT BOARDS

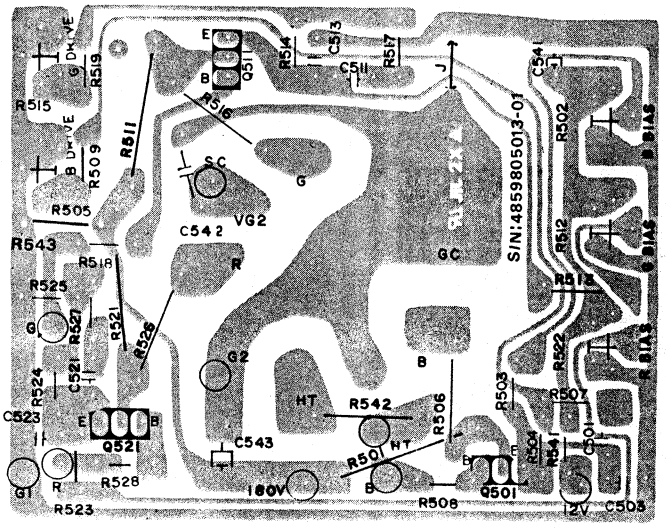
MAIN PCB —Solder Side—



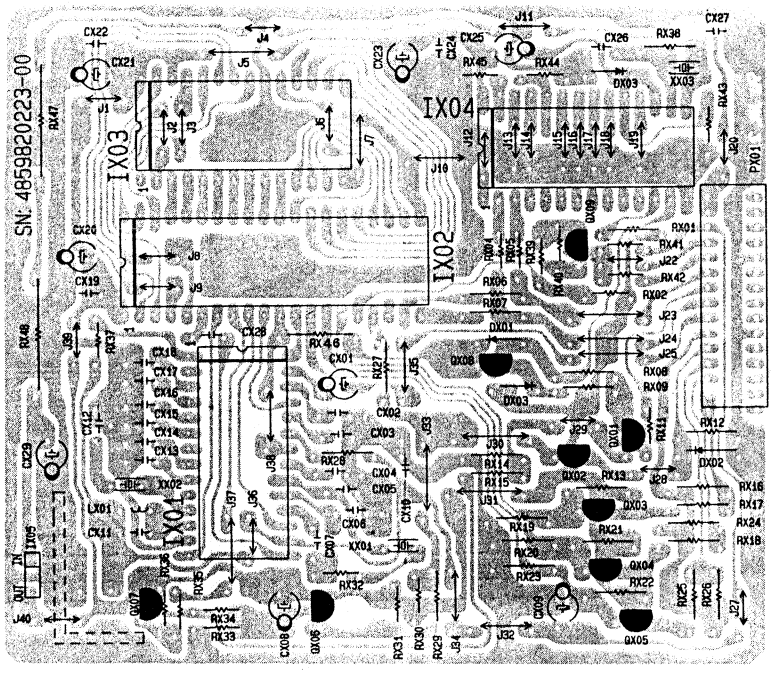
TUNING PCB —Solder Side—



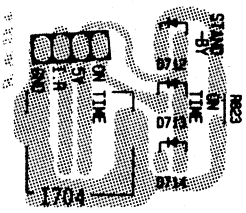
CRT PCB —Solder Side—



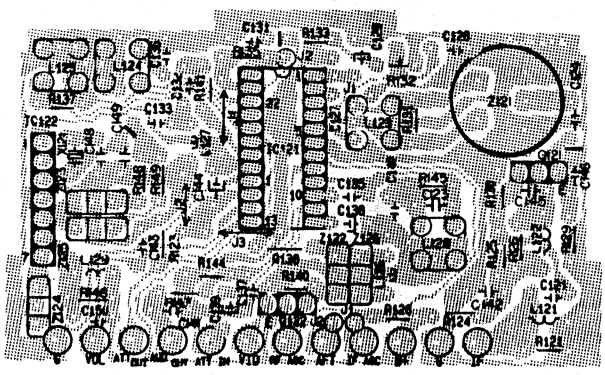
TEXT PCB —Solder Side—



PRE-AMP PCB —Solder Side—

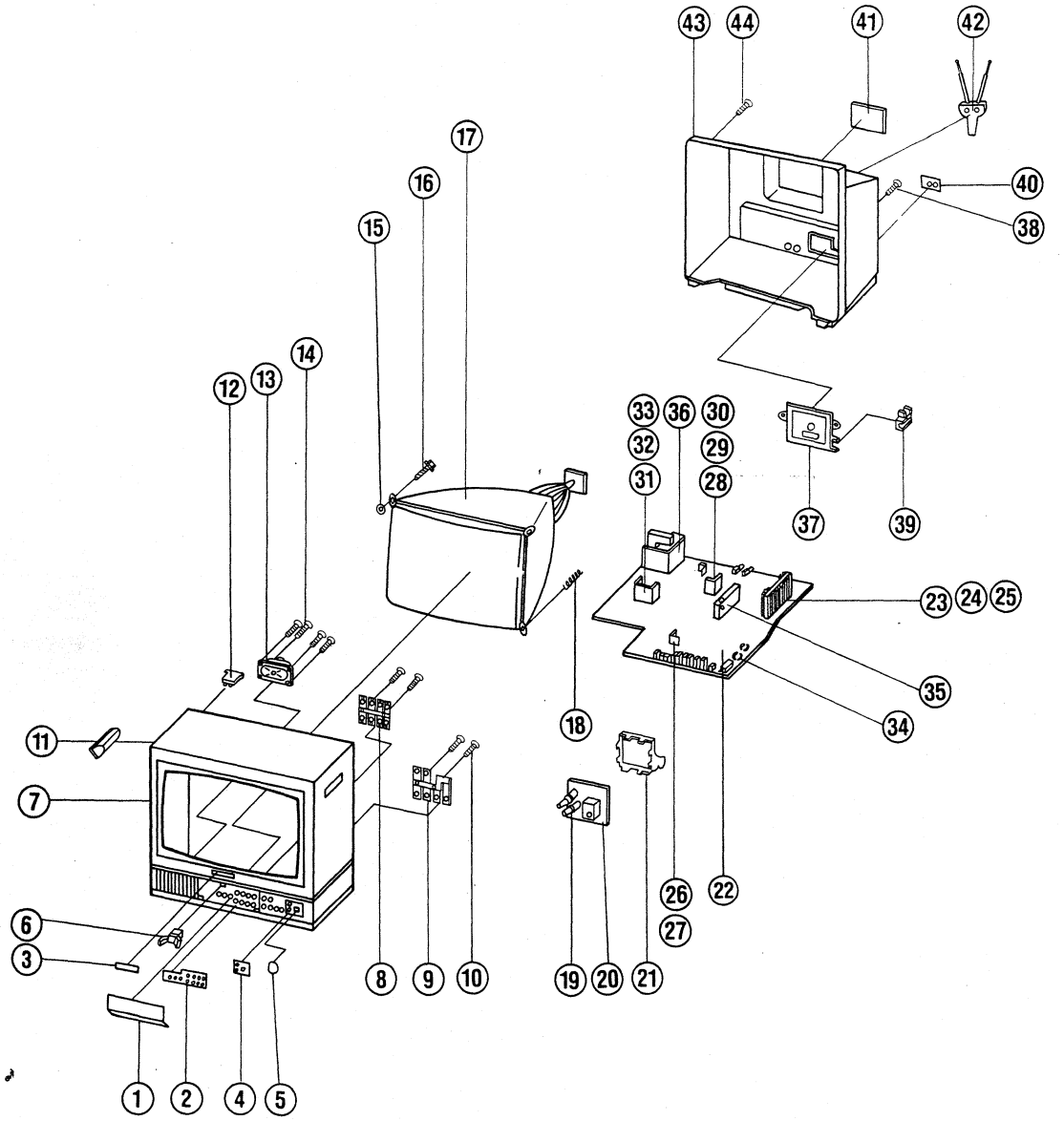


IF PCB —Solder Side—



■ EXPLODED VIEW

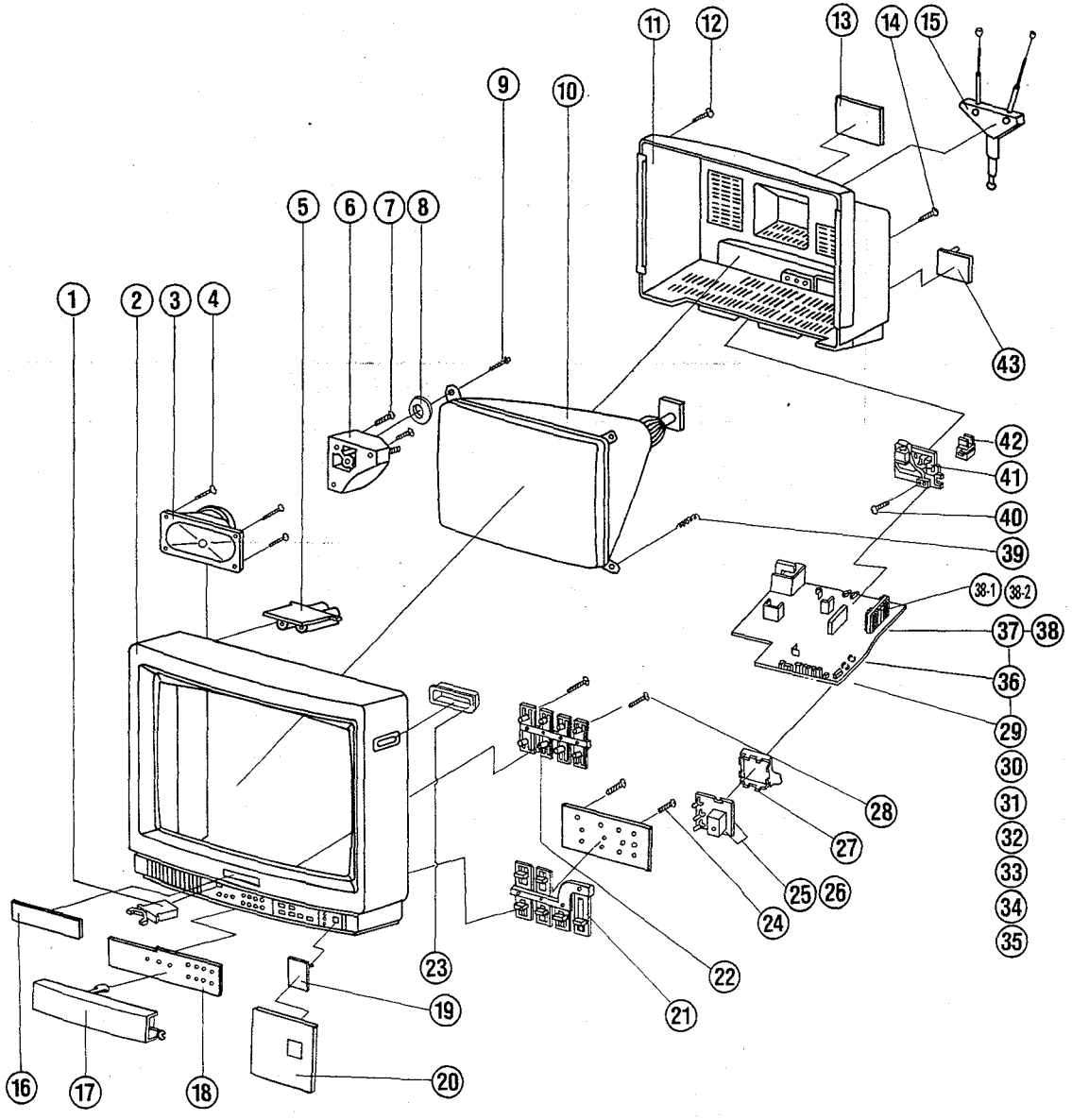
1) 20 INCH



No	PART CORD	PART NAME	Q'ty	DESCRIPTION	REMARK
1	4852805701	DOOR	1	ABS BK-PAINT	
2	4855511602	DECO CONTROL	1	P.C T0.3-SILK	
3	4855615900	BRAND MARK	1	A105P-H24 T0.4	
4	4855111503	DECO LED	1	PVC T1.0-PRINT SILK	
5	4855025000	DECO REMO	1	P.C RED	
6	4857923300	DOOR LOCK	1	LA701 (KIFCO)	
7	4852032501	MASK FRON	1	HIPS BK-PAINT SILK	
8	4854827301	BUTTON CONTROL "B"	1	HG ABS BK	
9	4854827001	BUTTON CONTROL "A"	1	ABS BK-PRESS BOARD	
10	7121301211	SCREW TAPPING	6	T2S PAN 3×12 MFZN	F/MARK+BUTTON
11	4852612501	HANDLE CABINET	2	HIPS BK	
12	4853311601	RETAINER BACK	2	HIPS NC	
13	4858305120	SPEAKER	1	2.5W 80HM PF-2D32S	
14	7128301011	SCREW TAPPING	4	T2S WAS 3×10 MFZN	F/MASK SPEAKER
15	4856213400	WASHER RUBBER	4	RUBBER BK	
16	4856212000	SCREW CRT FIX	4	SWRM+SK-5(L=30)	F/MASK SPEAKER
17	4859604160	CRT	1	A48JLL90×02	
18	4856716200	SPRING COIL	SUS		
19	97P2306800	LED HOLDER-A	2	P.P BLK	
20		PCB P-AMP	1	SPCC T1.0	
21	4853734900	RETA P-AMP	1	FR ABS BK	
22	9850163203	PCB MAIN AS	1	C-500 20"	
23	4857023300	HEAT SINK	1	AL EX	
24	7121301315	SCREW TAPPING	2	T2S PAN 3×13 MFSN	HEAT SINK+PCB
25	7128301211	SCREW TAPPING	2	T2S WAS 3×12 MFSN	HEAT SINK+IC
26	4857013300	HEAT SINK C	2		
27	7121300811	SCREW TAPPING	2	T2S PAN 3×8 MFZN	HEAT SINK C+TR
28	4857021600	HEAT SINK B	1	A1050P-H24 T2.0	
29	7121301315	SCREW TAPPING	2	T2S PAN 3×13 MFZN	HEAT SINK B+PCB
30	71211300811	SCREW TAPPING	1	T2S PAN 3×8 MFZN	HEAT SINK B+TR
31	4857021800	HEAT SINK C	1	A1050P-H24 T2.0	
32	7121301315	SCREW TAPPING	2	T2S PAN 3×13 MFZN	HEAT SINK C+PCB
33	7121300811	SCREW TAPPING	1	T2S PAN 3×8 MFZN	HEAT SINK C+TR
34	4857415000	CLIP FUSE	2	BSP3 SN5.2	
35	4857227400	SHIELD CASE	1	SPTH-C T0.3	
36	4857227500	SHIELD PLATE	1	SPTH-C T0.3	
37	4853621601	TERM ANT	1	HIPS BK.	
38	4853514400	STOPPER CORD	1	P.P BK	
39	7122401411	SCREW TAPPING	2	T2S TRS 4×14 MFZN	B/COVER+TERM
40	4855043804	DECO A/V	1	P.C T0.3	
41	4855415800	PLATE SPEC	1	150ART	P.E FILM (C/TV)
42	4850A02510	ROD ANTENNA	1	TSA-81088 L=600MM	
43	4852124100	COVER BACK	1	FR HIPS BK	
44	7122401411	SCREW TAPPING	4	T2S TRS 4×14 MFZN	F.MASK+B/COVER

■ EXPLODED VIEW

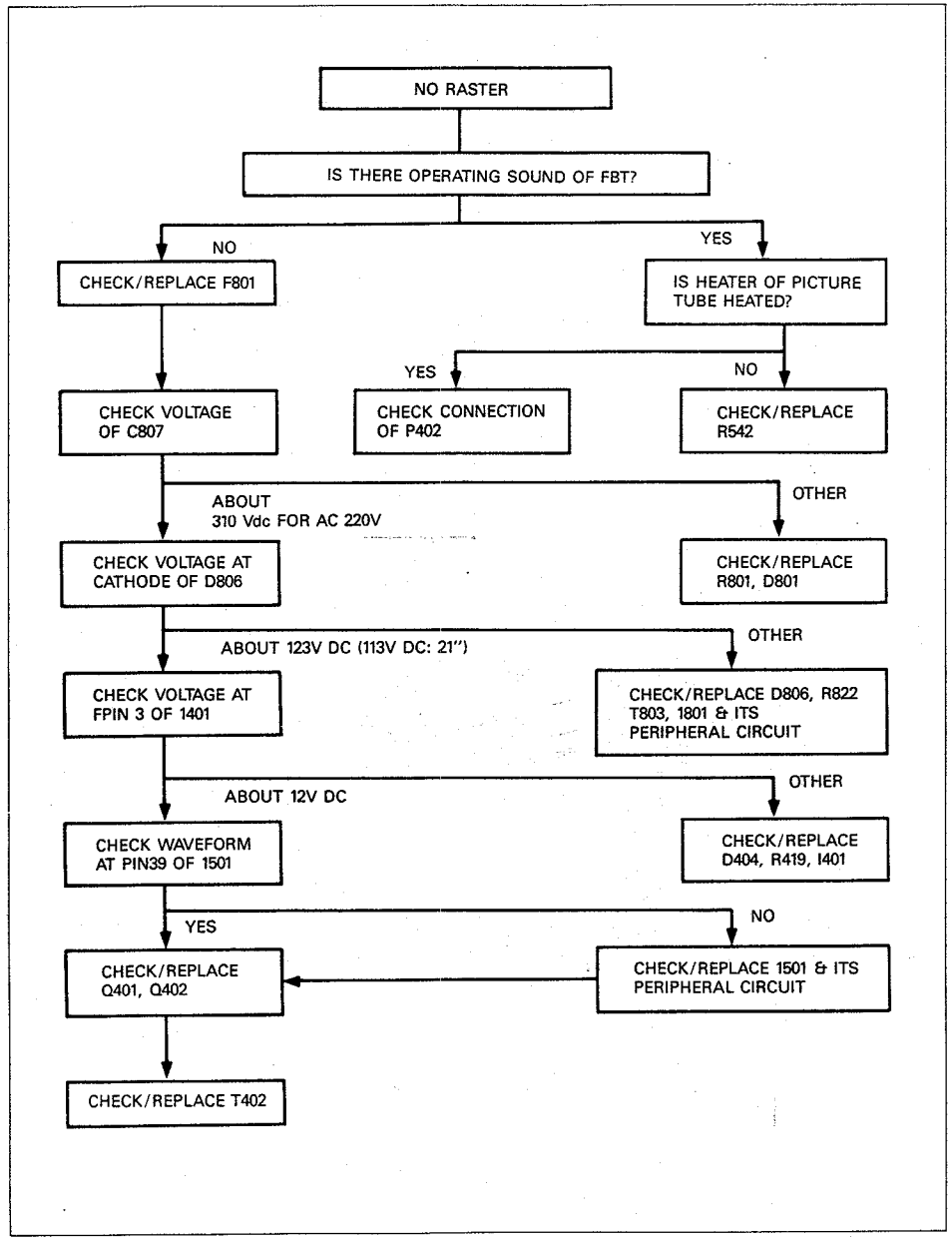
2) 20 INCH

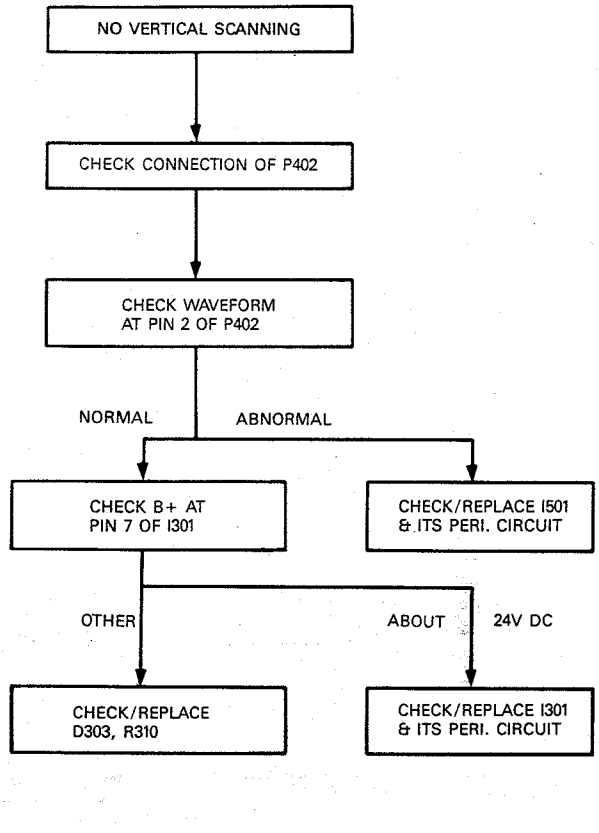


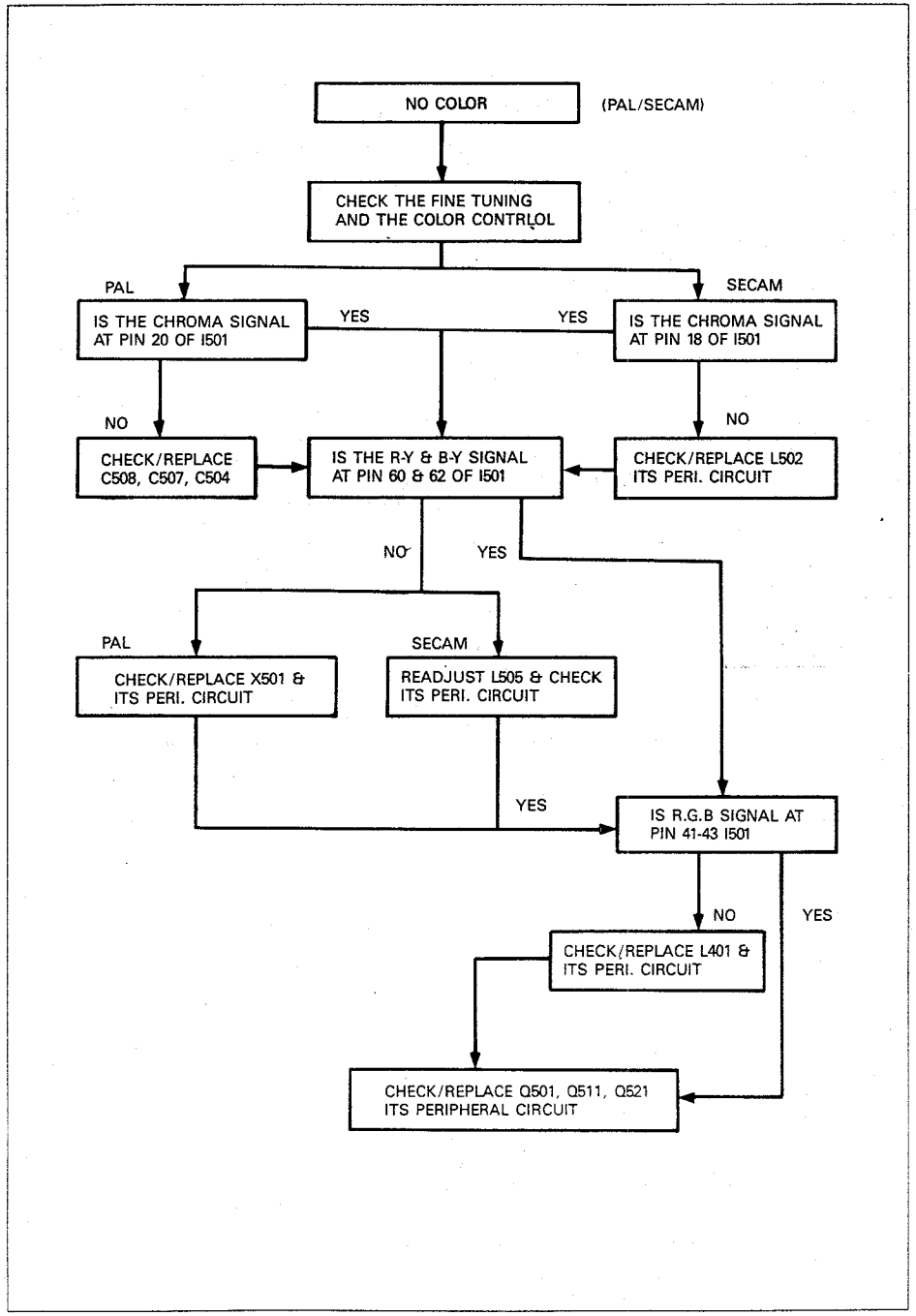
No	PART CORD	PART NAME	Q'ty	DESCRIPTION	REMARK
1	485792400	DOOR LOCK	1		
2	4852034501	MASK FRONT	1	HIPS BK PAINT SILK	
3	4858305120	SPEAKER	1	2.5W 80HM PF-2D32S	
4	7128391011	SCREW TAPPING	4	T2S WAS 3×10 MFZN	M/F+SP
5	4853311601	RETAINER BACK	2	HIPS NC	
6	4853115001	BRACKET	4	ABS NC	
7	7121501411	SCREW TAPPING	12	12S PAN 4×14 MFZN	
8	4856214900	WASHER RUBBER	4	RUBBER BK	
9	4856212000	SCREW CRT FIX	4	SWRM+SK-5 (L=30)	
10	48596057621	CRT	1	A51JSW 90×20	
11	4852125400	COVER BACK	1	FR HIPS BK	
12	7122401411	SCREW TAPPING	4	T2S TRS 4×14 MFZN	
13	4855412900	SPEC PLATE	1	PC	
14	7128300811	SCREW TAPPING	1	T2S WAS 3×8 MFZN	TERM+S/BOX
15	4860A02510	ROD ANT	1	TSA-8108, L=600MM	
16	4856613600	MARK BRAND	1	A1050P-H24 T0.25	
17	4852806801	DOOR	1	ABS BK PAINT	
18	4855111600	DECO CONTROL	1	PC T0.3 SILK	
19	4855025000	DECO REMO	1	AS DARK RED	
20	4855045101	DECO REMOCON	1	PVC T1.0 CL SILK	
21	4854829101	BUTTON	1	ABS BK	
22	4854827301	BUTTON CONT B	1	HG ABS BK	
23	48526125	CAB HINDLE	2	HIPS	
24	7121301211	SCREW TAPPING	3	T2S PAN 3×12 MFSN	M/F+B/C A
25		PCB P-AMP	1		
26	9792312300	RETA LED	1		
27	4853734900	RETA P-AMP	1	FR ABS BK	
28	7121201211	SCREW TAPPING	2	T2S PAN 3×12 MFZN	M/F+BOTTON
29	9850163206	PCB MAIN AS	1	C-500, 21"	
30	4857415000	CLIP FUSE	2	BSB3 SN 5.2	
31	4857013300	HT SILK C	2	A1050P-H24 T2.0	
32	7121300811	SCREW TAPPING	1	T2S PAN 3×8 MFZN	HEAT SINK C+TR
33	4857022501	HT SINK A	1	A1050P-H24 T2.0	
34	7128300811	SCREW TAPPING	1	T2S WAS 3×8 MFZN	HT SINK A-TR
35	4857021800	HEAT SINK C	1	A 1050P-H24 T2.0	
36	7121301315	SCREW TAPPING	4	T2S PAN 3×13 MFSN	HT SINK B-PCB
37	4857021600	HT SILB B	1	A105P-H24 T2.0	
38	7128300811	SCREW TAPPING	2	T2S WAS 3×8 MFZN	HT SINK B-TR
38-1	4857023300	HT SINK	1	AL EX	
38-2	7128301315	SCREW TAPPING	2	T2S PAN 3×13 MFSN	
39	4856716200	SPRING COIL	1	SUB	
40	7122401411	SCREW TAPPING	2	T2S TRS 4×14 MFZN	C/B+TERM
41	4853621601	TERMINAL ANT	1	HIPS BK	
42	4853514400	STOPPER CORD	1	FR P.P BK	
43	4855043805	DECO A/V	1	PC	T0.3

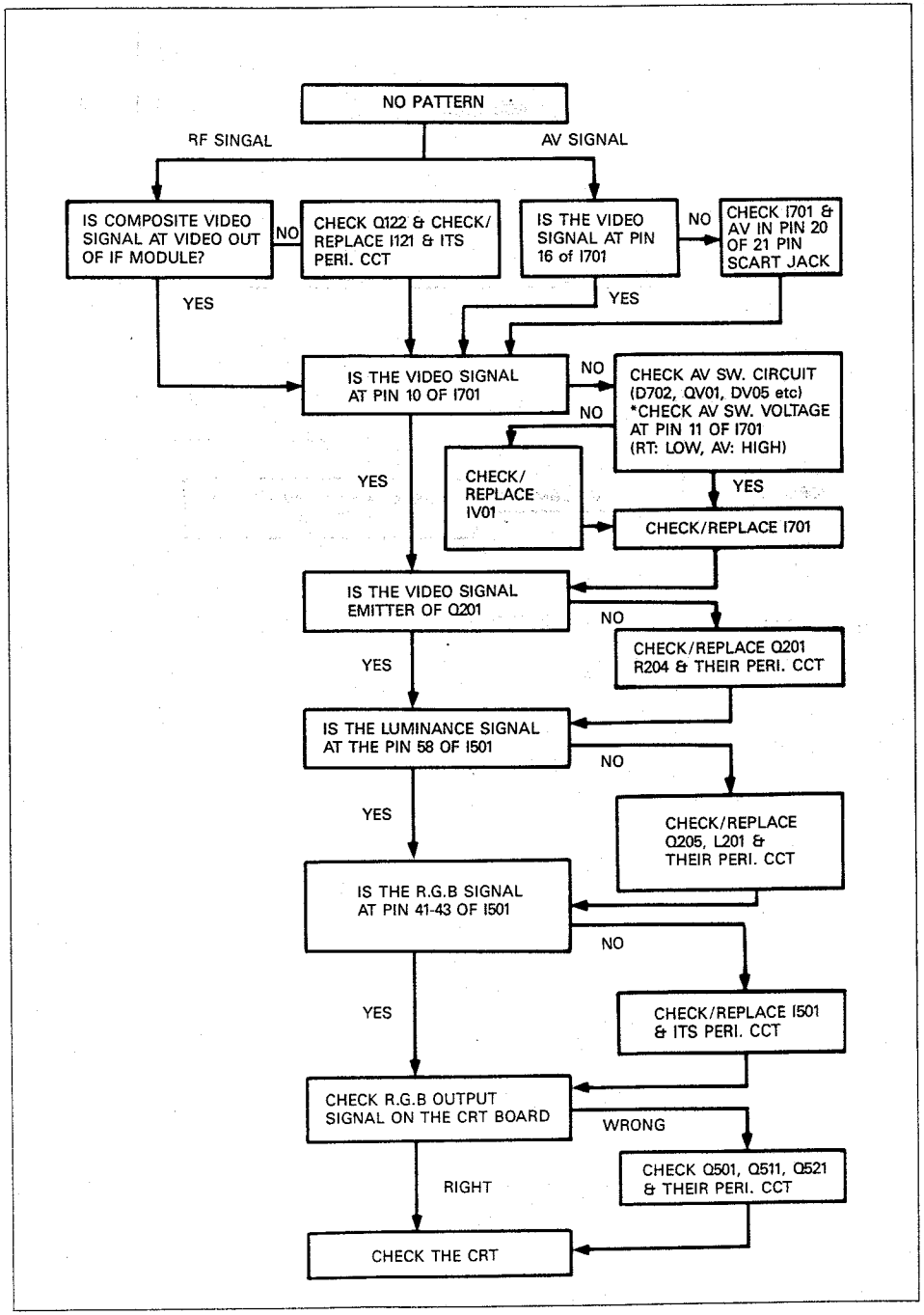
TROUBLE SHOOTING CHARTS

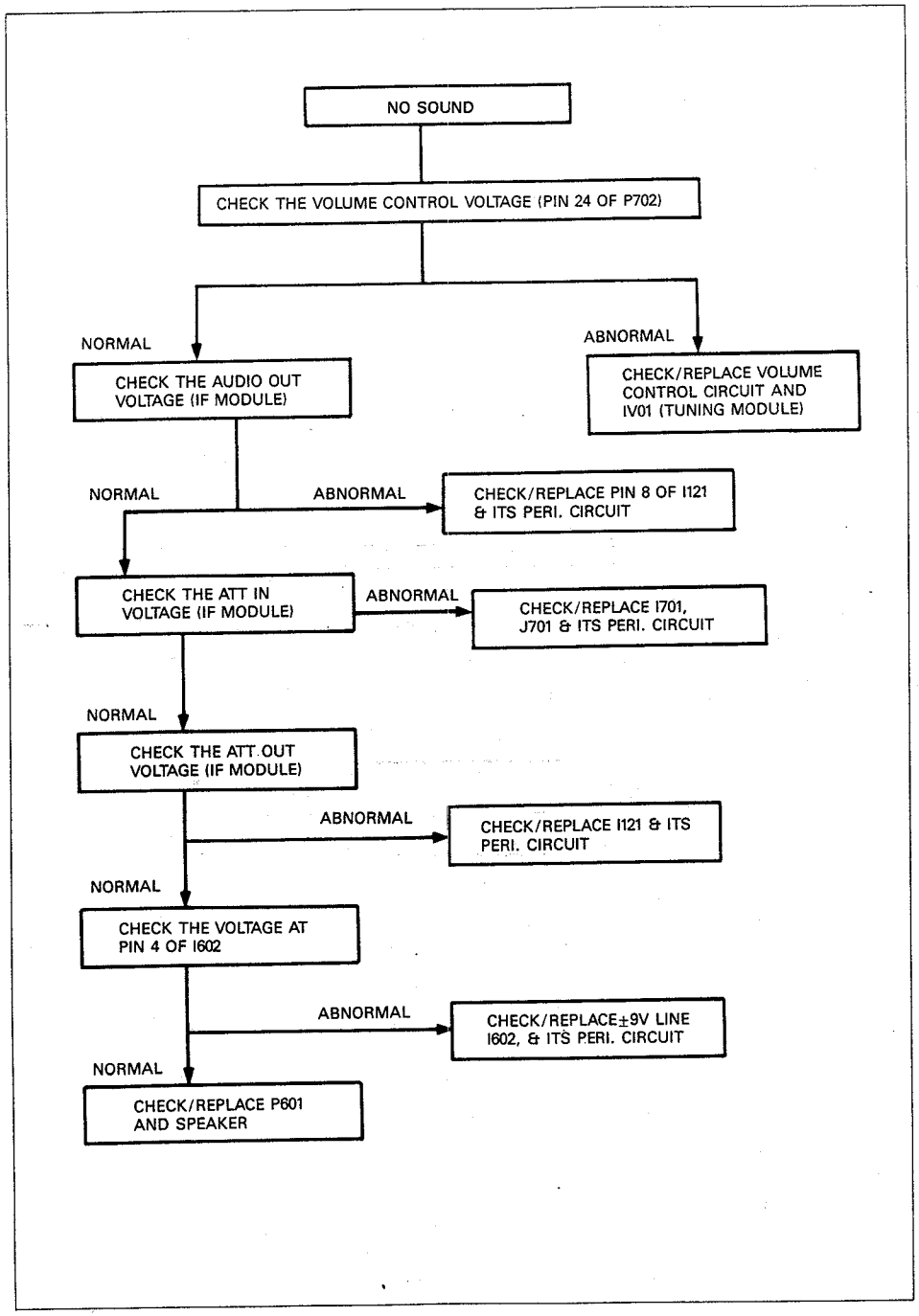
- NOTE: In all process, the service-man must check all bias circuits that are related with each trobled part.
- NO RASTER • NO VERTICAL SCANNING • NO PATTERN • NO COLOR • NO SPECIFIC COLOR • NO SOUND
- CONTROL SYSTEM TROUBLE • REMOCON NOT OPERATING • TELETEXT NOT OPERATING

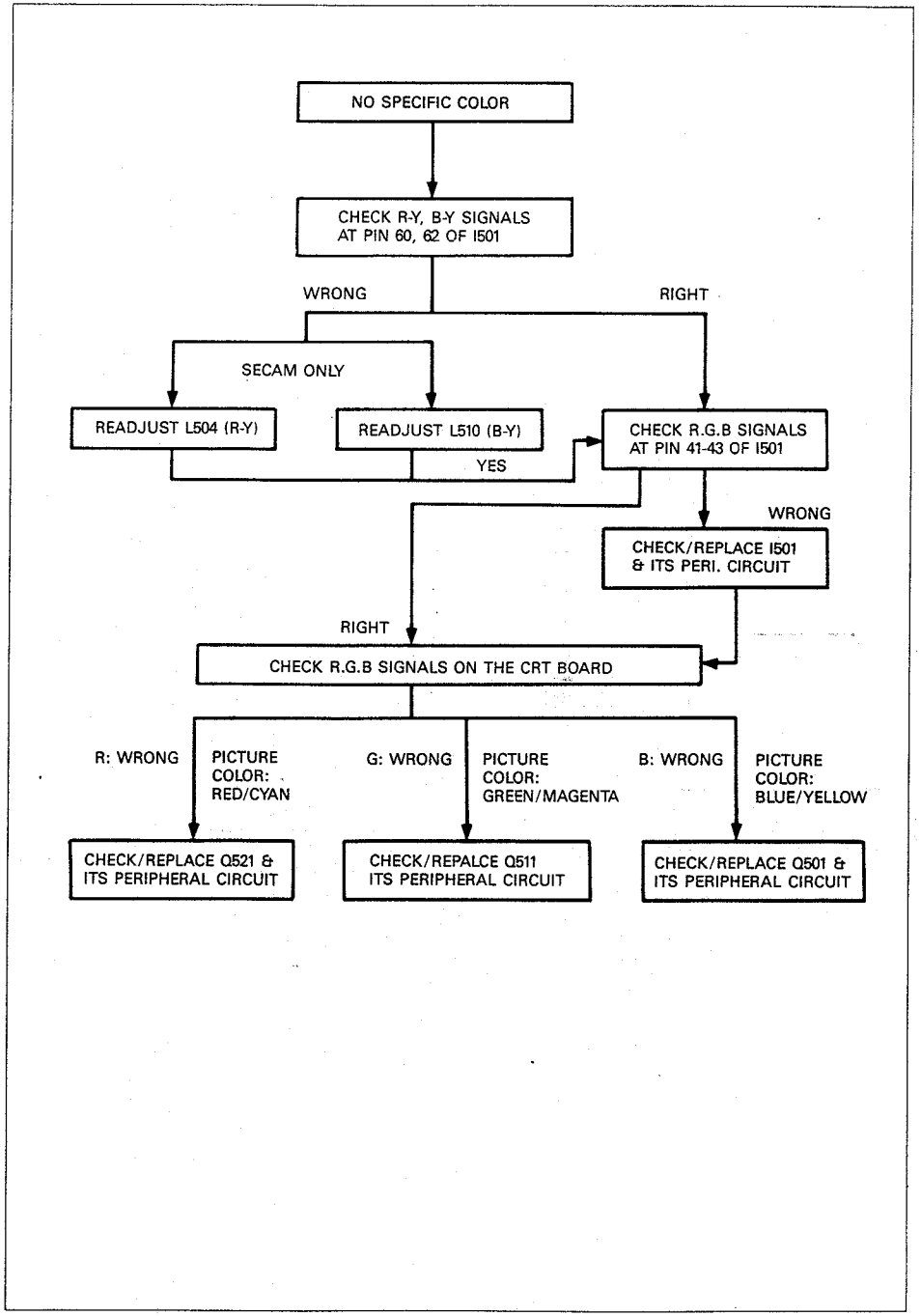


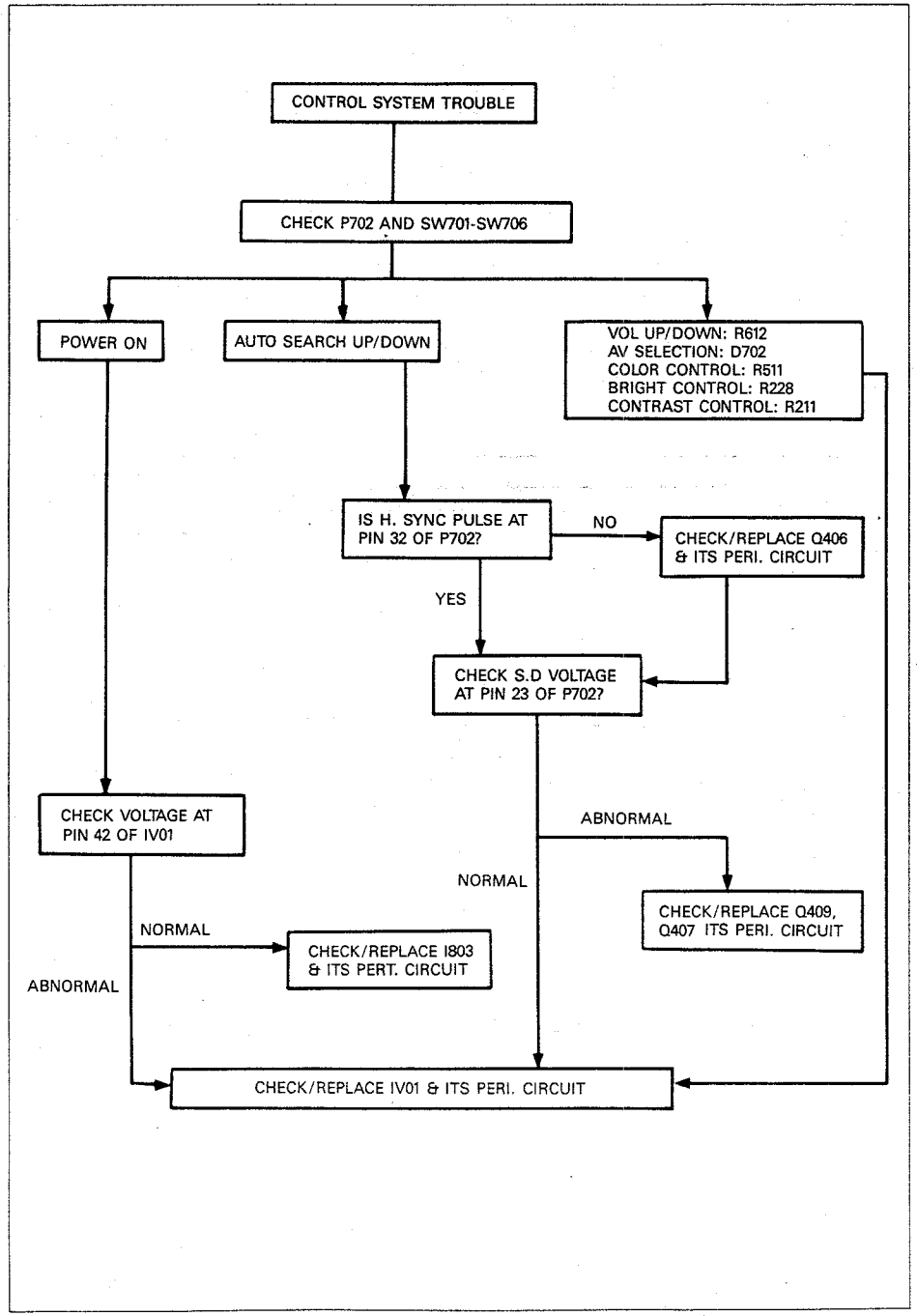


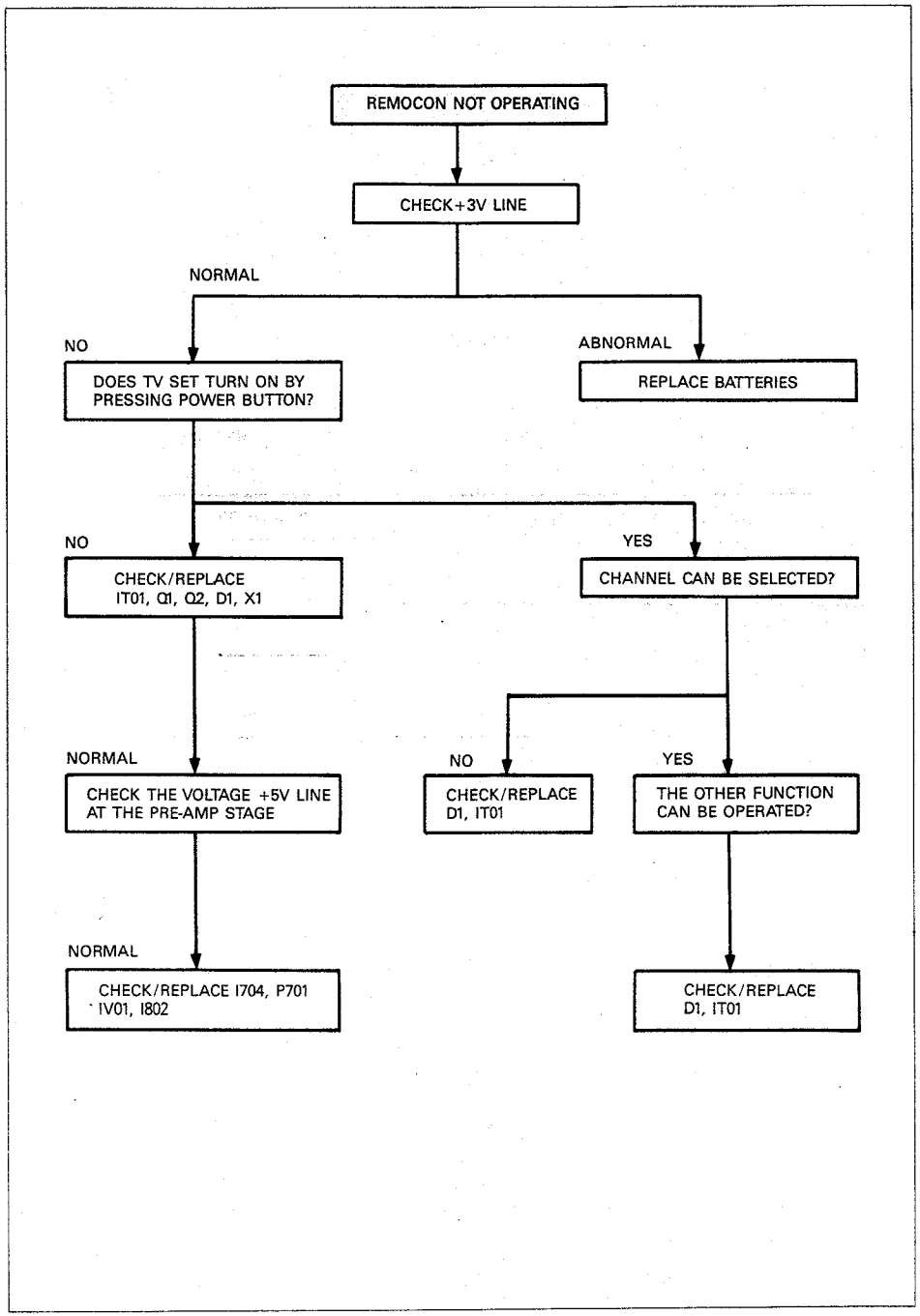

NO COLOR
(PAL/SECAM)
CHECK THE FINE TUNING AND THE COLOR CONTRLOL
PAL
SECAM
IS THE CHROMA SIGNAL AT PIN 20 OF I501
YES
YES
IS THE CHROMA SIGNAL AT PIN 18 OF I501
NO
NO
CHECK/REPLACE C508, C507, C504
IS THE R-Y & B-Y SIGNAL AT PIN 60 & 62 OF I501
CHECK/REPLACE L502 ITS PERI. CIRCUIT
NO
YES
PAL
SECAM
CHECK/REPLACE X501 & ITS PERI. CIRCUIT
READJUST L505 & CHECK ITS PERI. CIRCUIT
YES
IS R.G.B SIGNAL AT PIN 41-43 I501
NO
YES
CHECK/REPLACE L401 & ITS PERI. CIRCUIT
CHECK/REPLACE Q501, Q511, Q521 ITS PERIPHERAL CIRCUIT

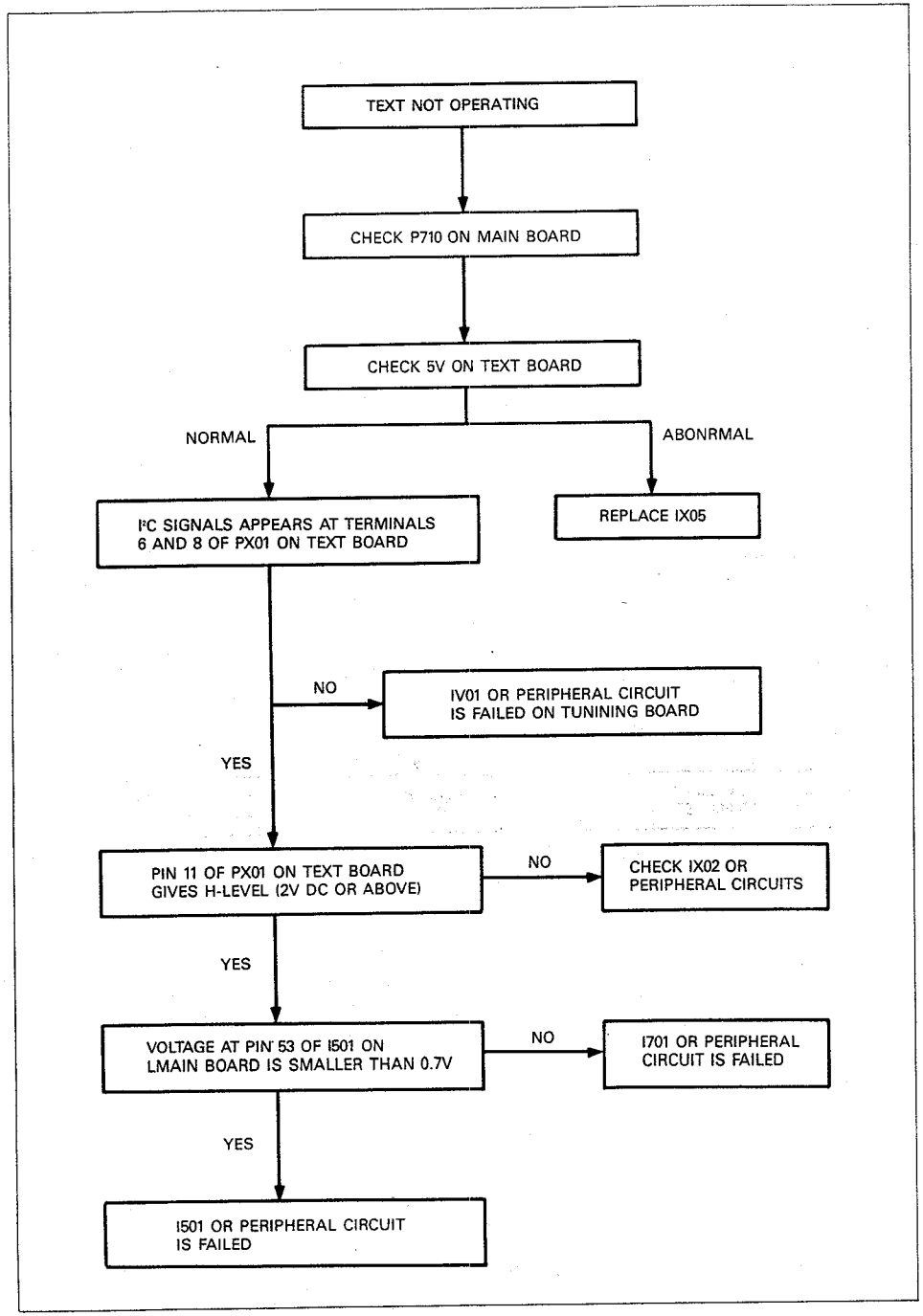

NO PATTERN
RF SINGAL
AV SIGNAL
IS COMPOSITE VIDEO SIGNAL AT VIDEO OUT OF IF MODULE?
NO
CHECK Q122 & CHECK/ REPLACE I121 & ITS PERI. CCT
IS THE VIDEO SIGNAL AT PIN 16 of I701
NO
CHECK I701 & AV IN PIN 20 OF 21 PIN SCART JACK
YES
YES
IS THE VIDEO SIGNAL AT PIN 10 OF I701
NO
NO
CHECK AV SW. CIRCUIT (D702, QV01, DV05 etc) *CHECK AV SW. VOLTAGE AT PIN 11 OF I701 (RT: LOW, AV: HIGH)
YES
CHECK/ REPLACE IV01
YES
CHECK/REPLACE I701
IS THE VIDEO SIGNAL EMITTER OF Q201
NO
CHECK/REPLACE Q201 R204 & THEIR PERI. CCT
YES
IS THE LUMINANCE SIGNAL AT THE PIN 58 OF I501
NO
YES
CHECK/REPLACE Q205, L201 & THEIR PERI. CCT
IS THE R.G.B SIGNAL AT PIN 41-43 OF I501
NO
YES
CHECK/REPLACE I501 & ITS PERI. CCT
CHECK R.G.B OUTPUT SIGNAL ON THE CRT BOARD
WRONG
RIGHT
CHECK Q501, Q511, Q521 & THEIR PERI. CCT
CHECK THE CRT


NO SOUND
CHECK THE VOLUME CONTROL VOLTAGE (PIN 24 OF P702)
NORMAL
ABNORMAL
CHECK THE AUDIO OUT VOLTAGE (IF MODULE)
CHECK/REPLACE VOLUME CONTROL CIRCUIT AND IV01 (TUNING MODULE)
NORMAL
ABNORMAL
CHECK/REPLACE PIN 8 OF I121 & ITS PERI. CIRCUIT
CHECK THE ATT IN VOLTAGE (IF MODULE)
ABNORMAL
CHECK/REPLACE I701, J701 & ITS PERI. CIRCUIT
NORMAL
CHECK THE ATT OUT VOLTAGE (IF MODULE)
ABNORMAL
CHECK/REPLACE I121 & ITS PERI. CIRCUIT
NORMAL
CHECK THE VOLTAGE AT PIN 4 OF I602
ABNORMAL
CHECK/REPLACE±9V LINE I602, & ITS PERI. CIRCUIT
NORMAL
CHECK/REPLACE P601 AND SPEAKER


NO SPECIFIC COLOR
CHECK R-Y, B-Y SIGNALS AT PIN 60, 62 OF I501
WRONG
RIGHT
SECAM ONLY
READJUST L504 (R-Y)
READJUST L510 (B-Y)
CHECK R.G.B SIGNALS AT PIN 41-43 OF I501
YES
WRONG
CHECK/REPLACE I501 & ITS PERI. CIRCUIT
RIGHT
CHECK R.G.B SIGNALS ON THE CRT BOARD
R: WRONG
PICTURE COLOR: RED/CYAN
G: WRONG
PICTURE COLOR: GREEN/MAGENTA
B: WRONG
PICTURE COLOR: BLUE/YELLOW
CHECK/REPLACE Q521 & ITS PERIPHERAL CIRCUIT
CHECK/REPALCE Q511 ITS PERIPHERAL CIRCUIT
CHECK/REPLACE Q501 & ITS PERIPHERAL CIRCUIT


CONTROL SYSTEM TROUBLE
CHECK P702 AND SW701-SW706
POWER ON
AUTO SEARCH UP/DOWN
VOL UP/DOWN: R612
AV SELECTION: D702
COLOR CONTROL: R511
BRIGHT CONTROL: R228
CONTRAST CONTROL: R211
IS H. SYNC PULSE AT PIN 32 OF P702?
NO
CHECK/REPLACE Q406 & ITS PERI. CIRCUIT
YES
CHECK S.D VOLTAGE AT PIN 23 OF P702?
CHECK VOLTAGE AT PIN 42 OF IV01
ABNORMAL
NORMAL
CHECK/REPLACE Q409, Q407 ITS PERI. CIRCUIT
NORMAL
CHECK/REPLACE I803 & ITS PERT. CIRCUIT
ABNORMAL
CHECK/REPLACE IV01 & ITS PERI. CIRCUIT


REMOCON NOT OPERATING
CHECK+3V LINE
NORMAL
NO
DOES TV SET TURN ON BY PRESSING POWER BUTTON?
ABNORMAL
REPLACE BATTERIES
NO
CHECK/REPLACE IT01, Q1, Q2, D1, X1
YES
CHANNEL CAN BE SELECTED?
NORMAL
CHECK THE VOLTAGE +5V LINE AT THE PRE-AMP STAGE
NO
CHECK/REPLACE D1, IT01
YES
THE OTHER FUNCTION CAN BE OPERATED?
NORMAL
CHECK/REPLACE I704, P701 IV01, I802
CHECK/REPLACE D1, IT01


TEXT NOT OPERATING
CHECK P710 ON MAIN BOARD
CHECK 5V ON TEXT BOARD
NORMAL
ABONRMAL
I²C SIGNALS APPEARS AT TERMINALS 6 AND 8 OF PX01 ON TEXT BOARD
REPLACE IX05
NO
IV01 OR PERIPHERAL CIRCUIT IS FAILED ON TUNINING BOARD
YES
PIN 11 OF PX01 ON TEXT BOARD GIVES H-LEVEL (2V DC OR ABOVE)
NO
CHECK IX02 OR PERIPHERAL CIRCUITS
YES
VOLTAGE AT PIN 53 OF I501 ON LMAIN BOARD IS SMALLER THAN 0.7V
NO
I701 OR PERIPHERAL CIRCUIT IS FAILED
YES
I501 OR PERIPHERAL CIRCUIT IS FAILED

REPLACEMENT PARTS LIST

In case of 21inch the designated component (*) are used.
ABBREVIATIONS:

Capacitors ..... CC : C Cera
CM: C Mylar
CE : C Electro C: C Line Across
CT : C Tantal
Resistors ..... RC : R Carbon Film
RP : R Carbon Comp
RM: R Metal-oxide Film
RT : R Cement
RS : R Semi-fixed
RF : R Fusible RO: Posistor
Miscellaneous ..... SF : Saw Filter
CF : Ceramic Filter
CR : Ceramic Resonator & Crystal
CT : Ceramic Trap

LOCATION	PART CODE	DESCRIPTION	CODE
■ PIF BOARD ASS'Y			
■ CAPACITORS			
C121	CCXB1H102K	50V 1000PF K	CC
C122	CXCH1H240J	50V CH 24PF J	CC
C124	CCXF1H103Z	50V 0.01MF Z	CC
C127	CCXF1H103Z	50V 0.01MF Z	CC
C128	CCXF1H103Z	50V 0.01MF Z	CC
C129	CEXF1H109A	50V 1MF RMS	CE
C131	CCXF1H103Z	50V 0.01MF Z	CC
C132	CXCH1H180J	50V CH 18PF J	CC
C133	CXCH1H560J	50V CH 56PF J	CC
C134	CCXF1H103Z	50V 0.01MF Z	CC
C135	CXCH1H709D	10V CH 7PF D	CC
C136	CCXF1H103Z	50V 0.01MF Z	CC
C137	CCXF1H103Z	50V 0.01MF Z	CC
C138	CEXF1H100A	50V 10MF RMS	CE
C139	CEXF1H229A	50V 2.2MF RMS	CE
C140	CCXF1H103Z	50V 0.01MF Z	CC
C141	CMXM2A683J	100V 0.068MF J	CM
C142	CCXF1H103Z	50V 0.01MF Z	CC
C143	CCXF1H103Z	50V 0.01MF Z	CC
C144	CEXF1C470A	16V 47MF RS	CE
C145	CXCH1H240J	50V CH 24PF J	CC
C146	CXCH1H360J	50V CH 36PF J	CC
■ ICS			
I101	1TA8701N-	TA8701N	
■ COILS			
L121	58C5580019	TRF-9225 (0.55UH)	
L122	58C9780027	TRF-1201B (0.97UH)	
L123	58F1R30034	TRF-1448S	
L124	58B38R9061	TRF-1444P	
L125	58B39R9061	TRF-1444P	
L126	58P120J001	PL-12UH J	
L127	58P120J001	PL-12UH J	
L128	58S5R50024	TRF-6702P	
■ TRANSISTORS			
Q121	TKTC388A--	KTC388A	
Q122	TKTC1815Y-	KTC1815-Y	

LOCATION	PART CODE	DESCRIPTION	CODE
■ RESISTORS			
R121	RD-AZ101J-	1/6 100 OHM J	RC
R123	RD-AZ332J-	1/6 3.3K OHM J	RC
R124	RD-AZ221J-	1/6 220 OHM J	RC
R125	RD-AZ562J-	1/6 5.6K OHM J	RC
R126	RD-AZ331J-	1/6 330 OHM J	RC
R128	RD-AZ822J-	1/6 8.2K OHM J	RC
R129	RD-AZ270J-	1/6 27 OHM J	RC
R130	RD-AZ102J-	1/6 1K OHM J	RC
R131	RD-AZ821J-	1/6 820 OHM J	RC
R132	RV2221502A	VM6CK-PH (1S) B5K	RS
R133	RD-AZ102J-	1/6 1K OHM J	RC
R135	RD-AZ433J-	1/6 43K OHM J	RC
R137	RD-AZ242J-	1/6 2.4K OHM J	RC
R138	RD-AZ331J-	1/6 330 OHM J	RC
R140	RD-AZ102J-	1/6 1K OHM J	RC
R141	RD-AZ391J-	1/6 390 OHM J	RC
R143	RD-AZ102J-	1/6 1K OHM J	RC
R144	RD-AZ272J-	1/6 2.7K OHM J	RC
R145	RD-AZ752J-	1/6 7.5K OHM J	RC
■ MISCELLANEOUS			
Z121	5PF1034---	F1034	SF
Z122	5PTPS55MB-	TPS-5.5MB	CT
Z123	5PSFE55MB-	SFE-5.5MB	CF
■ CRT BOARD ASS'Y			
■ CAPACITORS			
C501	CXCH1H221J	50V CH 220PF J	CC
C503	CCXB1H271K	50V 270PF K	CC
C511	CXCH1H221J	50V CH 220PF J	CC
C513	CXCH1H271K	50V 270PF K	CC
C521	CXCh1H221J	50V CH 220PF J	CC
C523	CCXB1H271K	50V 270PF K	CC
C541	CEXE1C101A	16V 100MF RS	CE
C542	CCXE3D103P	2KV 0.01MMF P	CC
C543	CEXE2E330A	250V 33MF RS	CE
■ TRANSISTORS			
Q501	TKTC2482--	KTC2482	
Q511	TKTC2482--	KTC2482	

LOCATION	PART CODE	DESCRIPTION	CODE
Q521	TKTC2482--	KTC2482	

■ RESISTORS

R501	RS02Z123J-	2W 12K OHM J	RM
R502	RV5316103-	CET-115A-10KB	RS
R503	RD-AZ152J-	1/6 1.5K OHM J	RC
C504	RD-AZ241J-	1/6 240 OHM J	RC
C505	RV6116201-	CET-115A-200B	RS
R506	RC-2Z332J-	1/2 3.3K OHM J	RP
R507	RD-AZ560J-	1/6 56 OHM J	RC
R508	RD-AZ471J-	1/6 470 OHM J	RC
C509	RD-AZ101J-	1/6 100 OHM J	RC
C511	RS02Z123J-	2W 12K OHM J	RM
C512	RV5316103-	CET-115A-10KB	RS
C513	RD-AZ152J-	1/6 1.5K OHM J	RC
R514	RD-AZ241J-	1/6 240 OHM J	RC
R515	RV6116201-	CET-115A-200B	RS
R516	RC-2Z332J-	1/2 3.3K OHM J	RP
R517	RD-AZ560J-	1/6 56 OHM J	RC
R518	RD-AZ471J-	1/6 470 OHM J	RC
R519	RD-AZ101J-	1/6 100 OHM J	RC
R521	RS02Z123J-	2W 12K OHM J	RM
R522	RV5316103-	CET-115A-10KB	RS
R523	RD-AZ152J-	1/6 1.5K OHM J	RC
R524	RD-AZ241J-	1/6 240 OHM J	RC
R525	RD-AZ201J-	1/6 200 OHM J	RC
R526	RC-2Z332J-	1/2 3.3K OHM J	RP
R527	RD-AZ560J-	1/6 56 OHM J	RC
R528	RD-AZ471J-	1/6 470 OHM J	RC
R541	RD-AZ621J-	1/6 620 OHM J	RC
R542	RF01Z629J-	1W 6.2 OHM J	RF
* R542	RF01Z479J-	1W 4.7 OHM J	RF

■ MISCELLANEOUS

0002	4859301530	SOCKET CRT (I-CSM6113)	
* 0002	4859302030	SOCKET CRT (CVT-3308-0901)	

■ VR TUNING ASS'Y

■ CAPACITORS

CV01	CMXM2A104J	100V 1.0MF J	CM
CV02	CMXM2A104J	100V 0.1MF J	CM
CV03	CTXD1V228K	35V 0.22MF K	CT
CV04	CXCH1H181J	50V CH 180PF J	CC
CV05	CEXE1H479A	50V 4.7MF RS	CE
CV06	CEXE1H479A	50V 4.7MF RS	CE
CV07	CEXE1H479A	50V 4.7MF RS	CE
CV08	CEXE1H809D	50V CH 8PF D	CC
CV09	CEXE1C330A	16V 33MF RS	CE
CV10	CCXF1H103Z	50V 0.01MF Z	CC
CV11	CEXE1C470A	16V 47MF RS	CE
CV12	CCXB1H122K	50V 1200PF K	CC

LOCATION	PART CODE	DESCRIPTION	CODE
CV13	CEXE1C470A	16V 47MF RS	CE
CV14	CCXF1H103Z	50V 0.01MF Z	CC
CV15	CMXM2A563J	100V 0.056MF J	CM
CV16	CCXB1H561K	50V 560PF K	CC
CV17	CCXB1H561K	50V 560PF K	CC
CV18	CCXB1H561K	50V 560PF K	CC
CV19	CCXB1H561K	50V 560PF K	CC
CV20	CN5X1H561M	B5RC0135-33N	CC
CV21	CEXE1C470A	16V 47MF RS	CE

■ DIODES

DV01	D1N4148--	1N4148
DV02	D1N4148--	1N4148
DV05	D1N4148--	1N4148
DV06	D1N4148--	1N4148
DV07	D1N4148--	1N4148

■ ICS

IV01	1C640019B-	PCA84C640/019B
IV02	1PCF8582--	PCF8582

■ TRANSISTORS

QV01	TKTC1815Y-	KTC1815-Y
QV02	TKTA1015Y-	KTA1015-Y
QV03	TKTC1815Y-	KTC1815-Y
QV04	TKTC1959Y-	KTC1959-Y
QV05	TKTA1015Y-	KTA1015-Y
QV06	TKTC1815Y-	KTC1815-Y
QV07	TKTA1015Y-	KTA1015-Y
QV08	TKTC1815Y-	KTC1818-Y
QV09	TKTC1815Y-	KTC1815-Y
QV10	TKTC1815Y-	KTC1815-Y
QV11	TKTC1959Y-	KTC1959-Y

■ RESISTORS

RV01	RD-AZ102J-	1/6 1K OHM J	RC
RV02	RD-AZ333J-	1/6 33K OHM J	RC
RV03	RD-AZ101J-	1/6 100 OHM J	RC
RV04	RD-AZ101J-	1/6 100 OHM J	RC
RV05	RD-AZ332J-	1/6 3.3K OHM J	RC
RV06	RD-AZ101J-	1/6 100 OHM J	RC
RV07	RD-AZ332J-	1/6 3.3K OHM J	RC
RV08	RD-AZ101J-	1/6 100 OHM J	RC
RV09	RD-4Z152J-	1/4 1.5K OHM J	RC
RV10	RD-4Z152J-	1/4 1.5K OHM J	RC
RV11	RD-4Z152J-	1/4 1.5K OHM J	RC
RV12	RD-4Z152J-	1/4 1.5K OHM J	RC
RV13	RD-AZ562J-	1/6 5.6K OHM J	RC
RV14	RD-AZ562J-	1/6 5.6K OHM J	R
RV15	RD-AZ333J-	1/6 33K OHM J	RC
RV16	RD-4Z823J-	1/4 82K OHM J	RC
RV17	RD-AZ472J-	1/6 4.7K OHM J	RC

LOCATION	PART CODE	DESCRIPTION	CODE
RV18	RD-AZ472J-	1/6 4.7K OHM J	RC
RV19	RD-4Z103J-	1/4 10K OHM J	RC
RV22	RD-AZ912J-	1/6 9.1K OHM J	RC
RV23	RD-AZ333J-	1/6 33K OHM J	RC
RV24	RD-AZ562J-	1/6 5.6K OHM J	RC
RV25	RD-AZ562J-	1/6 5.6K OHM J	RC
RV26	RD-AZ333J-	1/6 33K OHM J	RC
RV27	RD-AZ562J-	1/6 5.6K OHM J	RC
RV28	RD-AZ562J-	1/6 5.6K OHM J	RC
RV29	RD-AZ333J-	1/6 33K OHM J	RC
RV30	RD-4Z103J-	1/4 10K OHM J	RC
RV31	RD-4Z473J-	1/4 47K OHM J	RC
RV33	RD-4Z103J-	1/4 10K OHM J	RC
RV34	RD-AZ333J-	1/6 33K OHM J	RC
RV36	RD-4Z103J-	1/4 10K OHM J	RC
RV37	RD-AZ333J-	1/6 33K OHM J	RC
RV39	RD-4Z103J-	1/4 10K OHM J	RC
RV40	RD-4Z333J-	1/6 33K OHM J	RC
RV42	RD-4Z103J-	1/4 10K OHM J	RC
RV43	RD-AZ473J-	1/6 47K OHM J	RC
RV45	RD-AZ362J-	1/6 3.6K OHM J	RC
RV47	RD-AZ103J-	1/6 10K OHM J	RC
RV50	RD-4Z473J-	1/4 47K OHM J	RC
RV51	RD-AZ224J-	1/6 220K OHM J	RC

■ MISCELLANEOUS

XV01	5P10R0----	10 MHz	CR

■ TEXT BOARD ASS'Y

■ CAPACITORS

CX01	CEXE1H109A	50V 1MF RS	CE
CX02	CMXB2A683J	100V 0.068MF J	CM
CX03	CXCH1H221J	50V CH 220PF J	CC
CX04	CMXB2A473J	100V 0.047MF J	CM
CX05	CXCH1H180J	50V CH 18PF J	CC
CX06	CMXB2A473J	100V 0.047MF	CM
CX08	CEXE1C101A	16V 100MF RS	CE
CX09	CEXE1E101A	25V 100MF RS	CE
CX10	CMXM2A104J	100V 0.1MF J	CM
CX11	CXCH1H270J	50V CH 27PF J	CC
CX12	CXCH1H150J	50V CH 15PF J	CC
CX13	CXCH1H103J	50V CH 100PF J	CC
CX14	CCXB1H271K	50V 270PF K	CC
CX15	CMXB2A223J	100V 0.22MF J	CM
CX16	CCXB1H471K	50V 470PF K	CC
CX17	CCXB1H102K	50V 1000PF K	CC
CX18	CXCH1H150J	50V CH 15PF J	CC
CX19	CMXM2A104J	100V 0.1MF J	CM
CX20	CEXE1C101A	16V 100MF RS	CE
CX21	CEXE1C101A	16V 100MF RS	CE
CX22	CMXM2A104J	100V 0.1MF J	CM

LOCATION	PART CODE	DESCRIPTION	CODE
CX23	CEXE1C101A	16V 100MF RS	CE
CX24	CMXM2A104J	100V 0.1MF J	CM
CX25	CEXE1H109A	50V 1MF RS	CE
CX26	CXCH1H220J	50V CH 22PF J	CC
CX27	CXCH1H220J	50V CH 22PF J	CC
CX28	CCXF1H103Z	50V 0.01MF Z	CC
CX29	CEXE1E101A	25V 100MF RS	CE

■ DIODES

DX01	D1N4148---	1N4148
DX02	D1N4148---	1N4148
DX03	D1N4148---	1N4148
DX04	D1N4148---	1N4148

■ ICS

IX01	1SAA5231--	SAA5231
IX02	1SAA5243--	SAA5243
IX03	1M6264AL10	KM6264AL-10
IX04	1MABB461--	MABB461
IX05	1DKM05CV--	DKM05CV

■ COILS

LX01	58P150J001	PL-15UH J

■ TRANSISTORS

QX01	TKTC1815Y-	KTC1815-Y
QX02	TKTC1815Y-	KTC1815-Y
QX03	TKTC1815Y-	KTC1815-Y
QX04	TKTC1815Y-	KTC1815-Y
QX05	TKTC1815Y-	KTC1815-Y
QX06	TKTA1015Y-	KTC1015-Y
QX07	TKTA1015Y-	KTA1015-Y
QX08	TKTA1015Y-	KTA1015-Y
QX09	TKTC1815Y-	KTC1815-Y

■ RESISTORS

RX01	RD-4Z223J-	1/4 22K OHM J	RC
RX02	RD-AZ822J-	1/6 8.2K OHM J	RC
RX04	RD-AZ101J-	1/6 100 OHM J	RC
RX05	RD-AZ101J-	1/6 100 OHM J	RC
RX06	RD-AZ101J-	1/6 100 OHM J	RC
RX07	RD-AZ101J-	1/6 100 OHM J	RC
RX08	RD-4Z472J-	1/4 4.7K OHM J	RC
RX09	RD-4Z103J-	1/4 10K OHM J	RC
RX11	RD-AZ221J-	1/6 220 OHM J	RC
RX12	RD-AZ221J-	1/6 220 OHM J	RC
RX13	RD-4Z272J-	1/4 2.7K OHM J	RC
RX14	RD-4Z223J-	1/4 22K OHM J	RC
RX15	RD-4Z223J-	1/4 22K OHM J	RC
RX16	RD-4Z181J-	1/4 180 OHM J	RC
RX17	RD-AZ112J-	1/6 1.1K OHM J	RC
RX18	RD-AZ112J-	1/6 1.1K OHM J	RC

LOCATION	PART CODE	DESCRIPTION	CODE
RX19	RD-4Z272J-	1/4 2.7K OHM J	RC
RX20	RD-4Z272J-	1/4 2.7K OHM J	RC
RX21	RD-4Z272J-	1/4 2.7K OHM J	RC
RX22	RD-4Z272J-	1/4 2.7K OHM J	RC
RX23	RD-4Z272J-	1/4 2.7K OHM J	RC
RX24	RD-4Z181J-	1/4 180 OHM J	RC
RX25	RD-4Z112J-	1/4 1.1K OHM J	RC
RX26	RD-4Z181J-	1/4 180 OHM J	RC
RX27	RD-4Z471J-	1/4 470 OHM J	RC
RX28	RD-4Z683J-	1/4 68K OHM J	RC
RX29	RD-4Z103J-	1/4 10K OHM J	RC
RX30	RD-AZ472J-	1/6 4.7K OHM J	RC
RX31	RD-AZ272J-	1/6 2.7K OHM J	RC
RX32	RD-AZ331J-	1/6 330 OHM J	RC
RX33	RD-AZ222J-	1/6 2.2K OHM J	RC
RX34	RD-AZ103J-	1/6 10K OHM J	RC
RX35	RD-AZ103J-	1/6 10K OHM J	RC
RX36	RD-AZ182J-	1/6 1.8K OHM J	RC
RX37	RD-AZ122J-	1/6 1.2K OHM J	RC
RX38	RD-4Z105J-	1/4 1M OHM J	RC
RX39	RD-AZ103J-	1/6 10K OHM J	RC
RX40	RD-AZ103J-	1/6 10K OHM J	RC
RX41	RD-AZ103J-	1/6 10K OHM J	RC
RX42	RD-AZ472J-	1/6 4.7K OHM J	RC
RX46	RD-4Z823J-	1/4 82K OHM J	RC
RX47	RS02Z120J-	2W 12 OHM J	RM
RX48	RS02Z120J-	2W 12 OHM J	RM

■ MISCELLANEOUS

XX01	5PHC18U600	HC-18/U (6MHz)
XX02	5PHC13R875	HC-18/U (13.875MHz)
XX03	5PHC18U600	HC-18/U (6MHz)
CX07	4850L00200	TRIMMER (30PF)

■ MAIN BOARD ASS'Y

■ CAPACITORS

C101	CEXE1C470A	16V 47MF RS	CE
C102	CCXF1H103Z	50V 0.01MF Z	CC
C103	CEXE1H100A	50V 10MF RS	CE
C104	CCXF1H103Z	50V 0.01MF Z	CC
C105	CEXE1H100A	50V 10MF RS	CE
C106	CCXF1H103Z	50V 0.01MF Z	CC
C107	CEXE1H100A	50V 10MF RS	CE
C108	CEXE1H470A	50V 47MF RS	CE
C109	CCXF1H103Z	50V 0.01MF Z	CC
C110	CEXE1H100A	50V 10MF RS	CE
C111	CMXM2A104J	100V 0.1MF J	CM
C112	CEXE1H478A	50V 0.47MF RS	CE
C113	CEXF1C221V	16V 220MF RS	CE
C114	CCXF1H103Z	50V 0.01MF Z	CC

LOCATION	PART CODE	DESCRIPTION	CODE
C201	CEXE1C101A	16V 100MF RS	CE
C202	CCXF1H103Z	50V 0.01MF Z	CC
C205	CEXE1H220A	50V 22MF RS	CE
C206	CEXE1H100A	50V 10MF RS	CE
C207	CEXE1H478A	50V 0.47MF RS	CE
C208	CCXF1H103Z	50V 0.01MF Z	CC
C209	CXCH1H101J	50V CH 100PF J	CC
C210	CXCH1H430J	50V CH 43PF J	CC
C212	CCXB1H102K	50V 1000PF K	CC
C213	CXCH1H120J	50V CH 12PF J	CC
C214	CEXE1H109A	50V 1MF RS	CE
C216	CCXF1H103Z	50V 0.01MF Z	CC
C301	CEXE1H109A	50V 1MF RS	CE
C302	CMXB2A473J	100V 0.04MF J	CM
C303	CXCH1H510J	50V CH 51PF J	CC
C304	CEXE1V221A	35V 220MF RS	CE
C305	CMXB2A473J	100V 0.047MF J	CM
C307	CEXE1H339A	50V 3.3MF RS	CE
* C307	CEXE1H229A	50V 2.2MF RS	CE
C308	CEXE1C222A	16V 2200MF RS	CE
C309	CEXF1V102V	35V 1000MF RS	CE
C310	CCXB3A102K	1KV 1000PF K	CC
C402	CEXE1H100A	50V 10MF RS	CE
C403	CMXB2A682J	100V 6800PF J	CM
C404	CMXB2A103J	100V 0.01MF J	CM
C405	CEXE1H229A	50V 2.2MF RS	CE
C406	CMXB2A223J	100V 0.022MF J	CM
C407	CXCH2H271J	50V CH 270PF J	CC
C408	CCXB1H122K	50V 1200PF K	CC
C409	CEXE1H109A	50V 1MF RS	CE
C410	CEXE1H109A	50V 1MF RS	CE
C412	CXSL2H100D	500V SL 10PF D	CC
C413	CCXB2H471K	500V 470PF K	CC
C414	CCXB2H102K	500V 1000PF K	CC
C415	CCXB2H222K	500V 2200PF K	CC
C416	CMXH3C822J	1.6KV 8200PF J	CM
C418	CMXE2D514J	200V 0.51MF J	CM
* C418	CMXE2D364J	200V 0.36MF J	CM
C419	CEXE2C101A	160V 100MF RS	CE
C420	CCXB2H102K	500V 1000PF K	CC
C421	CCXB3A102K	1KV 1000PF K	CC
C423	CMXM2A104J	100V 0.1MF J	CM
C424	CEXE1E471A	25V 470MF RS	CE
C425	CEXE1C471A	16V 470MF RS	CE
C426	CCXB1H152K	50V 1500PF K	CC
C427	CCXF1H473Z	50V 0.047MF Z	CC
C428	CMXM2A104J	100V 0.1MF J	CM
C429	CCXF1H103Z	50V 0.01MF Z	CC
C430	CEXE1H109A	50V 1MF RS	CE
C431	CEXE1H109A	50V 1MF RS	CE
C434	CCXB1H561K	50V 560PF K	CC

LOCATION	PART CODE	DESCRIPTION	CODE
C435	CCXB1H152K	50V 1500PF K	CC
C501	CXCH1H330J	50V CH 33PF J	CC
C502	CXCH1H200J	50V CH 20PF J	CC
C503	CMXM2A103J	100V 0.01MF J	CM
C504	CCXF1H103Z	50V 0.01MF Z	CC
C505	CMXM2A273J	100V 0.027MF J	CM
C506	CMXB2A273J	100V 0.027MF J	CM
C507	CXCH1H330J	50V CH 33PF J	CC
C508	CXCH1H100D	50V CH 10PF D	CC
C509	CXCH1H390J	50V CH 39PF J	CC
C510	CXCH1H181J	50V CH 180PF J	CC
C511	CCXF1H103Z	50V 0.01MF Z	CC
C512	CEXE1H478A	50V 0.47MF RS	CE
C513	CCXF1H103Z	50V 0.01MF Z	CC
C514	CCXF1H103Z	50V 0.01MF Z	CC
C515	CXCH1H809D	50V CH 8PF D	CC
C516	CXCH1H680J	50V CH 68PF J	CC
C519	CEXF1C221V	16V 220MF RSS	CE
C520	CXCH1H709D	50V CH 7PF D	CC
C521	CXCH1H680J	50V CH 68PF J	CC
C522	CXCH1H181J	50V CH 180PF J	CC
C523	CXCH1H181J	50V CH 180PF J	CC
C524	CXCH1H181J	50V CH 180PF J	CC
C525	CMXM2A104J	100V 0.1MF J	CM
C526	CXCH1H181J	50V CH 180PF J	CC
C527	CMXM2A104J	100V 0.1MF J	CM
C528	CMXM2A104J	100V 0.1MF J	CM
C529	CMXM2A104J	100V 0.1MF J	CM
C530	CMXM2A104J	100V 0.1MF J	CM
C531	CCXF1H103Z	50V 0.01MF Z	CC
C534	CMXM2A104J	100V 0.1MF J	CM
C535	CMXM2A104J	100V 0.1MF J	CM
C536	CMXM2A104J	100V 0.1MF J	CM
C540	CEXE1H109A	50V 1MF RS	CE
C541	CEXE1H100A	50V 10MF RS	CE
C542	CCXF1H103Z	50V 0.01MF Z	CC
C544	CEXE1C101A	16V 100MF RS	CE
C545	CXCH1H181J	50V CH 180PF J	CC
C601	CCXB2H102K	500V 1000PF K	CC
C602	CEXE1V471A	35V 470MF RS	CE
C603	CEXE1E222A	25V 2200MF RS	CE
C604	CEXF1C222A	16V 2200MF RSM	CE
C605	CEXF1C222A	16V 2200MF RSM	CE
C606	CCXB1H331K	50V 3300PF K	CC
C608	CEXE1H100A	50V 10MF RS	CE
C610	CCXF1H473Z	50V 0.047MF Z	CC
C611	CEXE1H229A	50V 2.2MF RS	CE
C613	CEXE1H109A	50V 1M RS	CE
C701	CEXE1H229A	50V 2.2MF RS	CE
C703	CEXE1E100A	25V 10MF RS	CE
C704	CEXE1H229A	50V 2.2MF RS	CE

LOCATION	PART CODE	DESCRIPTION	CODE
C705	CEXE1H229A	50V 2.2MF RS	CE
C706	CEXE1H100A	50V 10MF RS	CE
C708	CEXE1H100A	50V 10MF RS	CE
C709	CEXE1H100A	50V 10MF RS	CE
C723	CEXE1H229A	50V 2.2MF RS	CE
C727	CMXM2A104J	100V 0.1MF J	CM
C728	CMXM2A104J	100V 0.1MF J	CM
C729	CMXM2A104J	100V 0.1MF J	CM
C730	CMXM2A104J	100V 0.1MF J	CM
C731	CMXM2A104J	100V 0.1MF J	CM
C732	CMXM2A104J	100V 0.1MF J	CM
C801	CLYS2E104M	250V 0.1MF	CL
C802	CLYS2E104M	250V 0.1MF	CL
C805	CEXE1H471A	50V 470MF RS	CE
C806	CCXB2H102K	500V 1000PF K	CC
C807	CEXM2G121T	400WV 120MF LWF	CE
C808	CEXE1H100A	50V 10MF RS	CE
C810	CEXE1H100A	50V 10MF RS	CE
C811	CCXB2H102K	500V 1000PF K	CC
C812	CCXE2L472M	4KV 4700PF M	CC
C813	CCXB3D102K	2KV 1000PF K	CC
C814	CCXE2H472P	500V 4700PF P	CC
C815	CCXE2H472P	500V 4700PF P	CC
C816	CCXE2H472P	500V 4700PF P	CC
C817	CCXE2H472P	500V 4700PF P	CC
C820	CCXB2H102K	500V 1000PF K	CC
C821	CEXE2C101A	160V 100MF RS	CE
C822	CEXE2C101A	160V 100MF RS	CE
C831	CCXB3A102K	1KV 1000PF K	CC

■ DIODES

D101	1UPC574J--	UPC574J
D102	DZPD9RI---	ZPD9.1
D201	DZPD5R1---	ZPD5.1
D202	D1N4148---	1N4148
D203	D1N4148---	1N4148
D301	DZPD7R5---	ZPD7.5
D302	D1N4936---	1N4936
D303	D1N4936---	1N4936
D304	DZPD5R1---	ZPD5.1
D402	D1N4936---	1N4936
D403	DZBX83020-	BZX83C20V
D404	D1N4936---	1N4936
D405	D1N4936---	1N4936
D406	D1N4148---	1N4148
D407	DZPD5R1---	ZPD5.1
D408	DZPD9R1---	ZPD9.1
D601	D1N4936---	1N4936
D602	D1N4148---	1N4148
D603	D1N4148---	1N4148
D701	D1N4148---	1N4148

LOCATION	PART CODE	DESCRIPTION	CODE
D705	D1N4148---	1N4148	
D712	DKLR114E--	KLR114E (RED)	
D801	DLB156----	LB156	
D802	D1N4936---	1N4936	
D803	D1N4936---	1N4936	
D804	DZPD4R3---	ZPD4.3	
D806	D1N4936---	1N4936	
D807	D1N4002---	1N4002	

■ ICS

I301	1AN5515---	AN5515	
I401	1LM7812CT-	LM7812CT	
I501	1TA8649AN-	TA8659AN	
I502	1AN5862K--	AN5862K	
I601	1MC7818C--	MC 7818-C	
I602	1TDA2006--	TDA2006	
I701	1TA7750P--	TA7750P	
I703	1TEA5114A-	TEA5114A	
I704	1DHR38N---	DHR38N	
I801	1STK734102	STK73410II	
I802	1DKM05CV--	DKM05CV	
I803	1PC816----	PC816	

■ COILS

LF801	5PLF3544B-	LF-3544B	
L101	58P101J001	PL-100UH J	
L201	58Q0000039	4014434TS	
L202	58P101J001	PL-100UH J	
L203	58P390J001	PL-39UH J	
L401	58P100J001	PL-10UH J	
L402	48C0000026	HC-4035	
L403	58C9430599	AZ-9004Y	
L404	58H0000016	L-102 (102μH)	
L405	58C9430599	AZ-9004Y	
L501	58P300J001	PL-30UH J	
L502	58F4328032	TRF-42MSB	
L503	48N0000011	TRF-5418	
L504	58N4250017	TRF-4567	
L505	58F4328030	TRF-4501	
L506	58P101J001	PL-100UH J	
L507	58P120J001	PI-12UH J	
L508	58Q0000029	SD-11PAL	
L509	58P101J001	PL-100UH J	
L510	58N4250017	TRF-4567	
L801	58C9430599	AZ-9004Y	
L803	58C9430599	AZ-9004Y	

■ TRANSISTORS

Q201	TKTC1815Y-	KTC1815-Y	
Q203	TKTC1815Y-	KTC1815-Y	
Q204	TKTC1815Y-	KTC1815-Y	
Q205	TKTC1815Y-	KTC1815-Y	

LOCATION	PART CODE	DESCRIPTION	CODE
Q401	TKTC2482--	KTC2482	
Q402	T2SD1555--	2SD1555	
Q404	TKTA1015Y-	KTA1015-Y	
Q405	TKTC1815Y-	KTC1815-Y	
Q406	TKTC1815Y-	KTC1815-Y	
Q407	TKTA1015Y-	KTA1015-Y	
Q801	TKTC1815Y-	KTC1815-Y	
Q802	TKTC1815Y-	KTC1815-Y	
Q803	TKTC1815Y-	KTC1815-Y	

■ RESISTORS

R100	RD-4Z365J-	1/4 3.6M OHM J	RC
R101	RD-AZ472J-	1/6 4.7K OHM J	RC
R102	RD-4Z472J-	1/6 4.7K OHM J	RC
R103	RS02Z752J-	2W 7.5K OHM J	RM
* R103	RS02Z562J-	2W 5.6K OHM J	RM
R104	RS01Z390J-	1W 39 OHM J	RM
R105	RD-AZ103J-	1/6 10K OHM J	RC
R108	RD-AZ202J-	1/6 2K OHM J	RC
R109	RD-AZ681J-	1/6 680 OHM J	RC
R136	RD-AZ183J-	1/6 18K OHM J	RC*
R204	RD-AZ561J-	1/6 560 OHM J	RC
R205	RD-4Z162J-	1/6 1.6K OHM J	RC
R206	RD-AZ153J-	1/6 15K OHM J	RC
R207	RD-AZ681J-	1/6 680 OHM J	RC
R208	RD-AZ472J-	1/6 4.7K OHM J	RC
R209	RD-AZ472J-	1/6 4.7K OHM J	RC
R210	RD-AZ472J-	1/6 4.7K OHM J	RC
R211	RD-AZ623J-	1/6 62K OHM J	RC
R215	RD-AZ102J-	1/6 1K OHM J	RC
R216	RD-AZ183J-	1/6 18K OHM J	RC
R218	RD-AZ682J-	1/6 6.8K OHM J	RC
R219	RD-AZ473J-	1/6 47K OHM J	RC
R220	RD-AZ103J-	1/6 10K OHM J	RC
R222	RV5417103-	19R B10K OHM	RS
R224	RD-AZ104J-	1/6 100K OHM J	RC
R225	RD-AZ823J-	1/6 82K OHM J	RC
R226	RD-AZ473J-	1/6 47K OHM J	RC
R227	RD-AZ472J-	1/6 4.7K OHM J	RC
R228	RD-AZ472J-	1/6 4.7K OHM J	RC
R229	RD-AZ752J-	1/6 7.5K OHM J	RC
R230	RD-AZ162J-	1/6 1.6K OHM J	RC
R231	RD-AZ163J-	1/6 16K OHM J	RC
R301	RD-4Z102J-	1/6 1K OHM J	RC
R302	RD-AZ393J-	1/6 39K OHM J	RC
R303	RV5417104-	H1051A-B	RS
R304	RD-AZ102J-	1/4 1K OHM J	RC
R305	RD-AZ153J-	1/6 15K OHM J	RC
R306	RD-4Z183J-	1/4 18K OHM J	RC
R307	RD-2Z229J-	1/2 2.2 OHM J	RC
R308	RD-2Z271J-	1/2 270 OHM J	RC

LOCATION	PART CODE	DESCRIPTION	CODE
R310	RF01Z339J-	1W 3.3 OHM J	RF
R311	RD-4Z104J-	1/4 100K OHM J	RC
R312	RD-AZ511J-	1/6 510 OHM J	RC
R313	RV5417103-	SR19R B10K OHM J	RS
R314	RD-4Z752J-	1/4 7.5K OHM J	RC
R402	RD-4Z472J-	1/4 4.7K OHM J	RC
R404	RV5417221-	H1051A-220B	RC
R405	RD-4Z103J-	1/4 10K OHM J	RC
R406	RD-AZ621J-	1/6 620 OHM J	RC
R407	RD-AZ332J-	1/6 3.3K OHM J	RC
R408	RD-4Z103J-	1/4 10K OHM J	RC
R409	RD-4Z273J-	1/4 27K OHM J	RC
R410	RD-4Z203J-	1/4 20K OHM J	RC
R411	RD-AZ131J-	1/6 130 OHM J	RC
R412	RD-AZ130J-	1/6 13 OHM J	RC
R413	RD-AZ224J-	1/6 220K OHM J	RC
R414	RD-4Z122J-	1/4 1.2K OHM J	RC
R415	RS03Z242J-	3W 2.4K OHM J	RM
R418	RS01Z561J-	1/1 560 OHM J	RM
R419	RF01Z109J-	1/1 1 OHM J	RF
R420	RF01Z100J-	1/1 10 HM J	RF
R421	RD-4Z102J-	1/4 1K OHM J	RC
R422	RD-4Z244J-	1/4 240K OHM J	RC
R423	RD-4Z103J-	1/4 10K OHM J	RC
R424	RD-AZ124J-	1/6 120K OHM J	RC
R425	RD-4Z563J-	1/4 56K OHM J	RC
R426	RD-AZ184J-	1/6 180K OHM J	RC
R427	RD-AZ122J-	1/6 1.2K OHM J	RC
R429	RD-AZ202J-	1/6 2K OHM J	RC
R430	RD-AZ102J-	1/6 1K OHM J	RC
R431	RD-AZ563J-	1/6 56K OHM J	RC
R432	RD-AZ474J-	1/6 470K OHM J	RC
R433	RD-AZ183J-	1/6 18K OHM J	RC
R434	RD-AZ183J-	1/6 18K OHM J	RC
R436	RD-AZ472J-	1/6 4.7K OHM J	RC
R437	RD-AZ153J-	1/6 15K OHM J	RC
R438	RD-AZ123J-	1/6 12K OHM J	RC
R439	RD-AZ473J-	1/6 47K OHM J	RC
R440	RD-AZ103J-	1/6 10K OHM J	RC
R441	RS03Z113J-	3W 11K OHM J	RM
R442	RD-4Z750J-	1/4 75 OHM J	RC
R444	RD-AZ512J-	1/6 5.1K OHM J	RC
R501	RD-AZ182J-	1/6 1.8K OHM J	RC
R502	RD-AZ752J-	1/6 7.5K OHM J	RC
R503	RD-4Z275J-	1/4 2.7M OHM J	RC
R504	RD-4Z821J-	1/4 820 OHM J	RC
R505	RD-AZ821J-	1/6 820 OHM J	RC
R506	RD-AZ334J-	1/6 330K OHM J	RC
R507	RD-AZ202J-	1/6 2K OHM J	RC
R508	RV5417102	H1051A-1KB	RS
R509	RD-AZ472J-	1/6 4.7K OHM J	RC

LOCATION	PART CODE	DESCRIPTION	CODE
R510	RD-AZ242J-	1/6 2.4K OHM J	RC
R511	RD-AZ272J-	1/6 2.7K OHM J	RC
R513	RD-AZ473J-	1/6 47K OHM J	RC
R514	RD-AZ273J-	1/6 27K OHM J	RC
R515	RD-AZ182J-	1/6 1.8K OHM J	RC
R516	RD-AZ822J-	1/6 8.2K OHM J	RC
R517	RD-AZ561J-	1/6 560 OHM J	RC
R518	RD-AZ561J-	1/6 560 OHM J	RC
R519	RD-AZ822J-	1/6 8.2K OHM J	RC
R520	RD-AZ152J-	1/6 1.5K OHM J	RC
R521	RD-AZ152J-	1/6 1.5K OHM J	RC
R535	RD-AZ202J-	1/6 2K OHM J	RC
R536	RD-AZ391J-	1/6 390 OHM J	RC
R537	RD-AZ303J-	1/6 30K OHM J	RC
R601	RS02Z150J-	2W 150 OHM J	RM
* R601	RS02Z100J-	2W 10 OHM J	RM
R602	RS01Z150J-	1W 15 OHM J	RM
R603	RD-AZ223J-	1/6 22K OHM J	RC
R604	RD-AZ223J-	1/6 22K OHM J	RC
R605	RD-4Z109J-	1/4 1 OHM J	RC
R606	RD-AZ823J-	1/6 82K OHM J	RC
R607	RD-AZ302J-	1/6 3K OHM J	RC
R608	RD-AZ363J-	1/6 36K OHM J	RC
R610	RD-AZ432J-	1/6 4.3K OHM J	RC
R611	RD-AZ563J-	1/6 56K OHM J	RC
R612	RD-AZ222J-	1/6 2.2K OHM J	RC
R613	RD-4Z562J-	1/4 5.6K OHM J	RC
R615	RD-AZ303J-	1/6 30K OHM J	RC
R703	RD-AZ510J-	1/6 51 OHM J	RC
R705	RD-AZ510J-	1/6 51 OHM J	RC
R706	RD-AZ510J-	1/6 51 OHM J	RC
R708	RD-AZ750J-	1/6 75 OHM J	RC
R720	RD-AZ332J-	1/6 3.3K OHM J	RC
R770	RD-AZ240J-	1/6 24 OHM J	RC
R771	RD-AZ240J-	1/6 24 OHM J	RC
R772	RD-AZ240J-	1/6 24 OHM J	RC
R801	RX10T339J-	10W 3.3 OHM J	RX
R802	RS02Z910J-	2W 91 OHM J	RM
R803	RS02Z104J-	2W 100K OHM J	RM
R804	RD-4Z153J-	1/4 15K OHM J	RC
R805	RS02Z560J-	2W 56 OHM J	RM
R806	RD-4Z220J-	1/4 22 OHM J	RC
R807	RS02Z330J-	2W 33 OHM J	RM
R808	RS01Z109J-	1W 1 OHM J	RM
R809	RERPZ5180A	ERP-25B0N180A	RO
R810	RD-2Z565J-	1/2 5.6M OHM J	RP
R812	RD-4Z181J-	1/4 180 OHM J	RC
R813	RD-AZ222J-	1/6 2.2K OHM J	RC
R814	RD-AZ103J-	1/6 10K OHM J	RC
R815	RD-AZ103J-	1/6 10K OHM J	RC
R816	RD-AZ333J-	1/6 33K OHM J	RC
R817	RD-AZ103J-	1/6 10K OHM J	RC

LOCATION	PART CODE	DESCRIPTION	CODE
R818	RD-AZ471J-	1/6 470 OHM J	RC
R819	RD-4Z473J-	1/4 47K OHM J	RC
R822	RS01Z100J-	1W 10 OHM J	RM
R823	RD-AZ391J-	1/6 390 OHM J	RC

■ MICELLANEOUS

SW701	5S50101008	KPT-1105V	
SW702	5S50202001	SKHTLA0002	
SW703	5S50202001	SKHTLA0002	
SW704	5S50202001	SKHTLA0002	
SW705	5S50202001	SKHTLA0002	
SW706	5S50202001	SKHTLA0002	
SW801	5S40202004	SY13-4	
T401	5TD0000012	HD-15A	
T802	50P0000163	TPW-2017	
T803	50MK000027	TSM-4225	
* T803	50M8000035	TSM-4245	
	4859704130	TUNER (VTSA1SZ3)	
J701	4859200401	SOCKET PGB (SR-21A1	
P801A	4859901510	CORD POWER AS	
F801	5FSGB4022L	FUSE (AC 250V T4A)	
T402	50H0000096	FBT (KFS-60802)	
* T402	50H0000088	FBT (KFS-60676)	
X501	5PHE18U3--	4.43MHz	CR

■ CRT

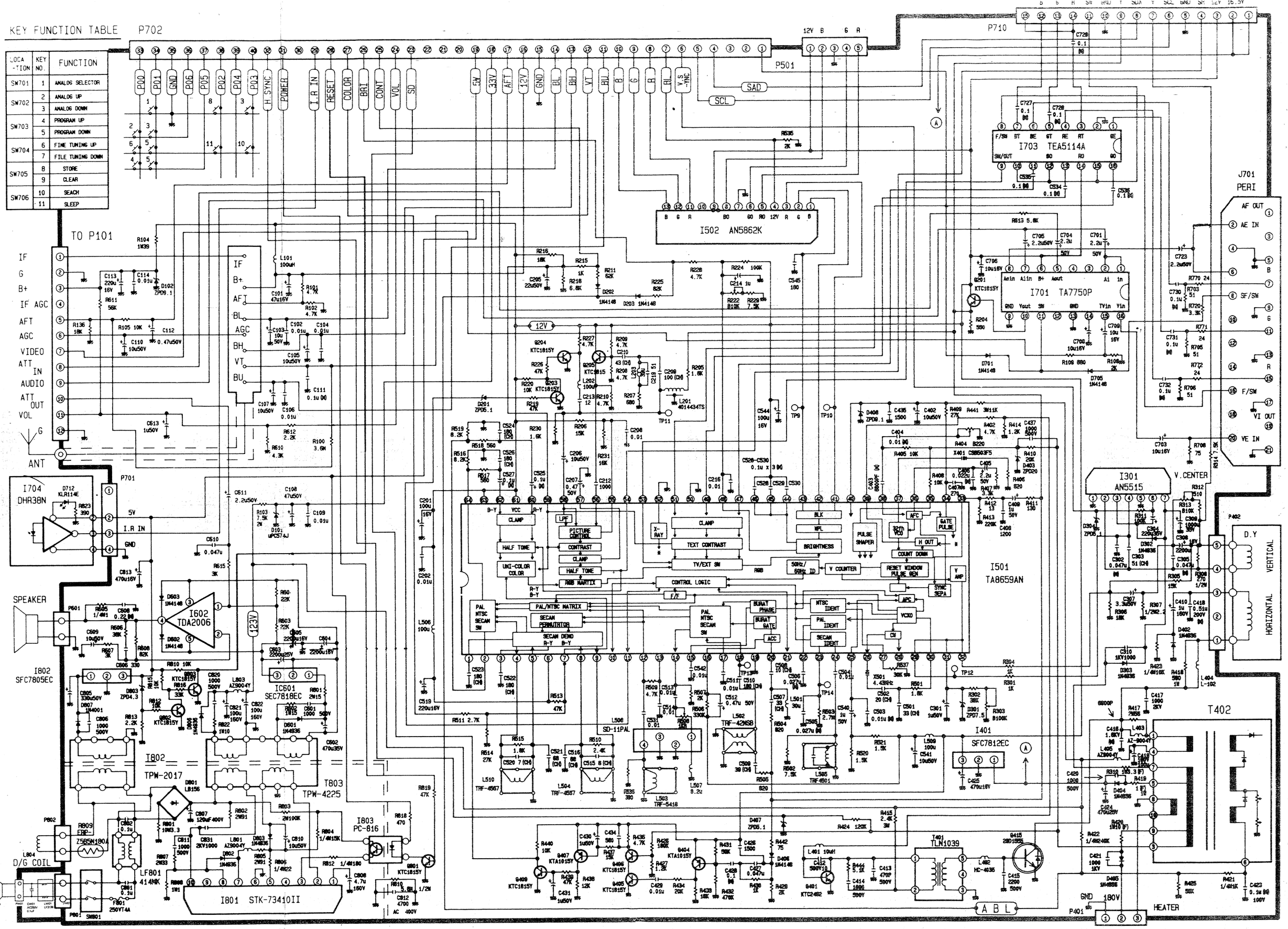
V901	4859604160	A48JLL90X02 P38	
* V901	4859605762	A51JSW90X02	P38

■ OTHERS

L901	58G0000067	SK-2011-B	
* L901	58G0000074	DC-2070	

KEY FUNCTION TABLE P702

LOCATION	KEY NO.	FUNCTION
SW701	1	ANALOG SELECTOR
SW702	2	ANALOG UP
	3	ANALOG DOWN
SW703	4	PROGRAM UP
	5	PROGRAM DOWN
SW704	6	FINE TUNING UP
	7	FILE TUNING DOWN
SW705	8	STORE
	9	CLEAR
SW706	10	SEACH
	11	SLEEP



TUNING MODULE

IV01 M34300M4-230SP

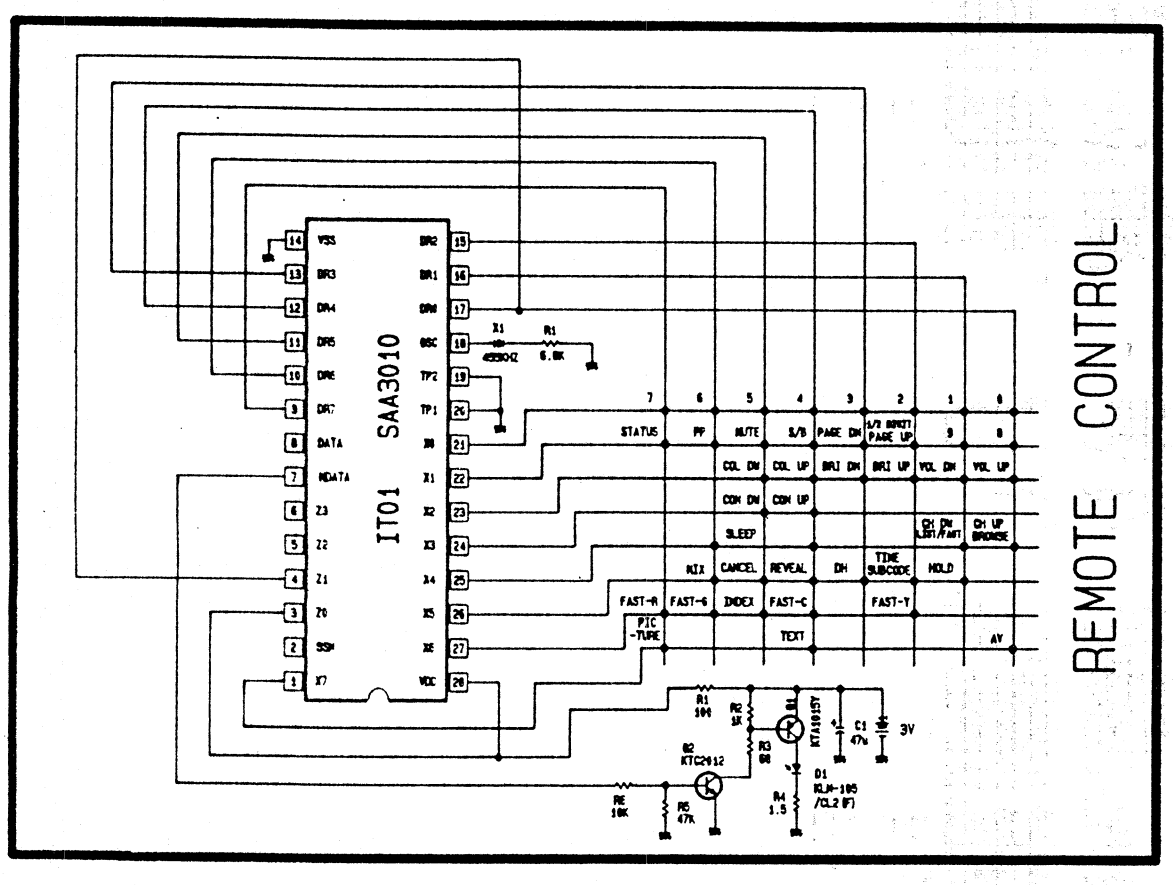
IV02 M6M80011P

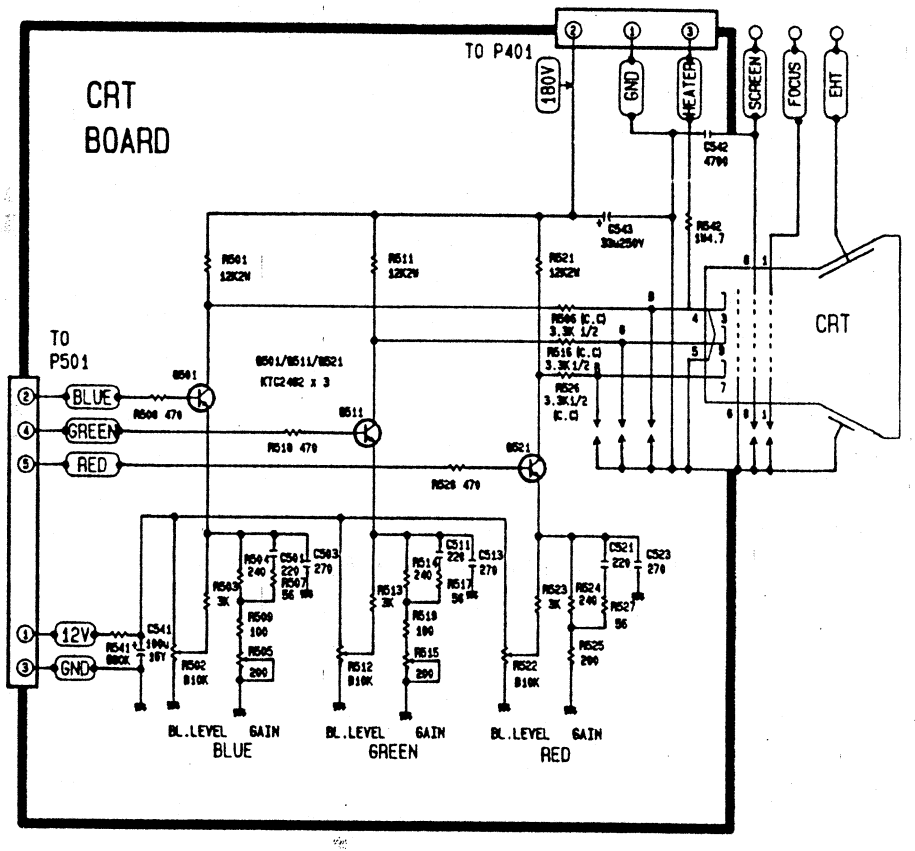
IV03 LA7910

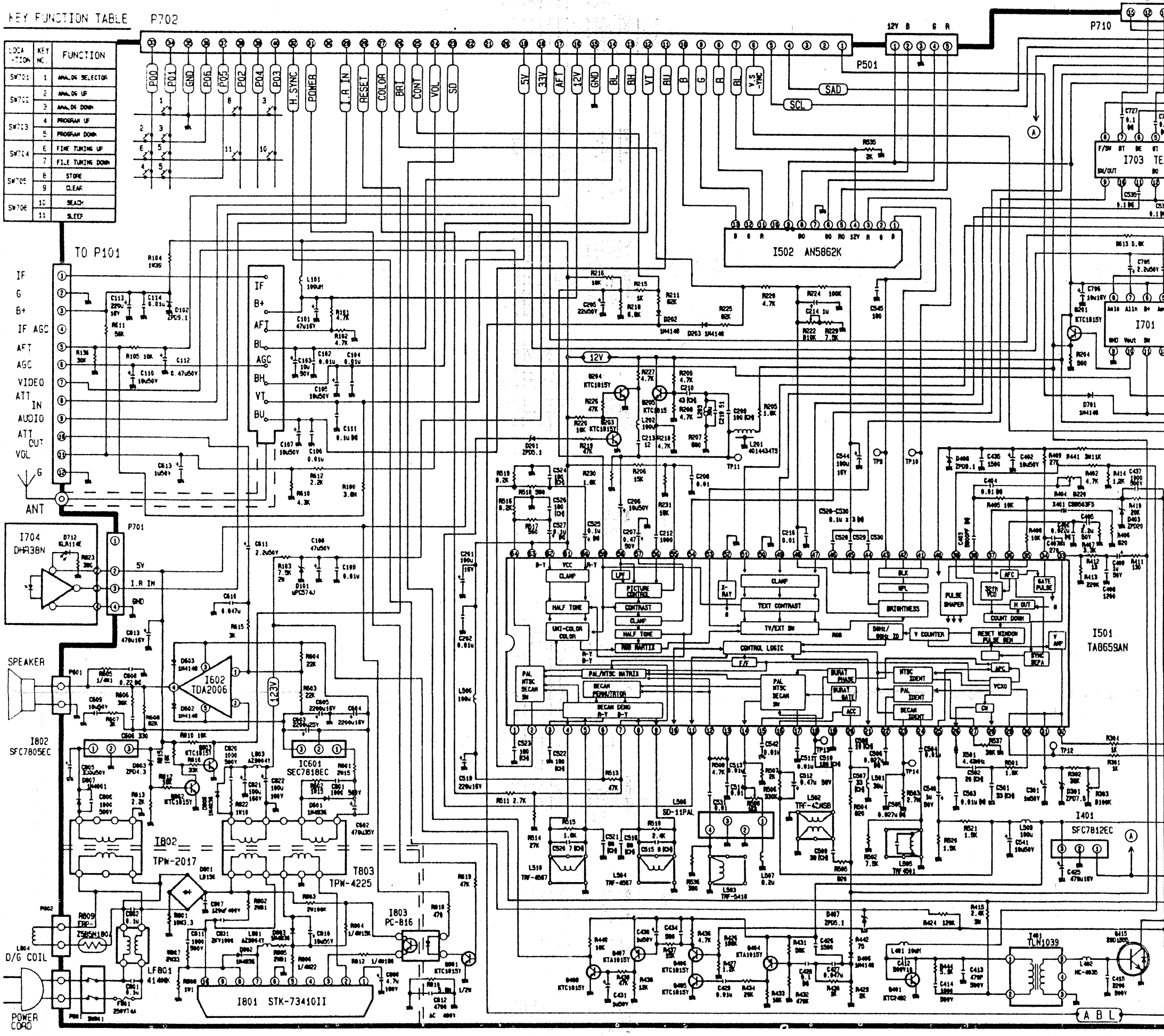
POWER ON START

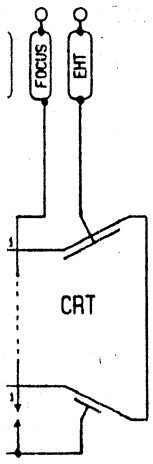
AUTO OFF

AV1 AV2 AVIN V.SYNC BLANK R G BU VT BH BL GND 12V AFT 33V 5V KEY0 SD VOLUME CONT BRIG COLOR RESET I.R IN ON TIMER POWER H.SYNC KEY1 KEY2 KEY3 KEY4 KEY5 KEY6 KEY7 KEY8


REMOTE CONTROL
IT01 SAA3010
STATUS
PP
MUTE
S/B
PAGE DN
PAGE UP
VOL DN
VOL UP
COL DN
COL UP
BRI DN
BRI UP
CON DN
CON UP
SLEEP
CANCEL
REVEAL
DH
TIME SUBCODE
HOLD
FAST-R
FAST-G
INDEX
FAST-C
FAST-Y
PIC -TURE
TEXT
AV


CRT BOARD
TO P401
180V
GND
HEATER
SCREEN
FOCUS
EHT
CRT
TO P501
BLUE
GREEN
RED
12V
GND
Q501/Q511/Q521 KTC2482 x 3
BL.LEVEL GAIN BLUE
BL.LEVEL GAIN GREEN
BL.LEVEL GAIN RED


KEY FUNCTION TABLE P702
LOCATION | KEY NO. | FUNCTION
SW701 | 1 | ANALOG SELECTOR
SW702 | 2 | ANALOG UP
SW702 | 3 | ANALOG DOWN
SW703 | 4 | PROGRAM UP
SW703 | 5 | PROGRAM DOWN
SW704 | 6 | FINE TUNING UP
SW704 | 7 | FILE TUNING DOWN
SW705 | 8 | STORE
SW705 | 9 | CLEAR
SW706 | 10 | SEACH
SW706 | 11 | SLEEP
P00 P01 GND P06 P05 P02 P04 P03 H.SYNC POWER I.R IN RESET COLOR BRI CONT VOL SD
5V 33V AFT 12V GND BL BH VT BU B G R BL Y/C SYNC
SAD
SCL
P501
P710
TO P101
IF G B+ IF AGC AFT AGC VIDEO ATT IN AUDIO ATT OUT VOL G
ANT
P701
I704 DHR38N
SPEAKER
I802 SFC7805EC
I602 TDA2006
I802 TPW-2017
IC601 SEC7818EC
T803 TPW-4225
I803 PC-816
I801 STK-7341011
D/G COIL
POWER CORD
I502 AN5862K
I501 TA8659AN
I703 TEA5
I701 TA
I401 SFC7812EC
TUN1039
SD-11PAL
L502 TRF-42JNSB
L505 TRF-4591
L503 TRF-5418
L504 TRF-4567
L510 TRF-4567
PICTURE CONTROL
CONTRAST
HALF TONE
UNI-COLOR COLOR
RGB MATRIX
CONTROL LOGIC
PAL/NTSC MATRIX
SECAM DEMO/TRIOR
SECAM DEMO
CLAMP
TEXT CONTRAST
TV/EXT SW
BRIGHTNESS
PULSE SHAPER
H OUT
COUNT DOWN
V COUNTER
RESET WINDOW PULSE GEN
V AMP
SYNC SEPA
AFC
GATE PULSE
BURST PHASE
BURST GATE
ACC
VCXO
CN
PAL IDENT
SECAM IDENT
NTSC IDENT
BLK
MPL
X-RAY
A B L



SCHEMATIC DIAGRAM
CHASSIS : C-520
(S/N : 4858802122)

NOTES :

1. RESISTANCE VALUES ARE IN OHMS K = 1000 M = 1000000
2. CAPACITANCE VALUES I.0 AND ABOVE ARE IN pF THOSE BELOW ARE IN uF EXCEPT AS INDICATED.
3. INDUCTOR VALUES IN uH EXCEPT AS INDICATED.
4. VOLTAGES ARE MEASURED FROM CHASSIS GROUND TO POINT INDICATED WITH A " VTVM " WHILE RECEIVING A COLOR BAR SIGNAL WITH ALL CONTROLS SET TO THE MAXIMUM POSITION. (FOR A NOMINAL LINE VOLTAGE AC 110-260V 50HZ).
5. SINCE THE CIRCUIT DIAGRAM IS A STANDARD ONE THE CIRCUIT AND CIRCUIT CONSTANTS MAY BE SUBJECT TO CHANGE FOR IMPROVEMENT WITHOUT ANY NOTICE.

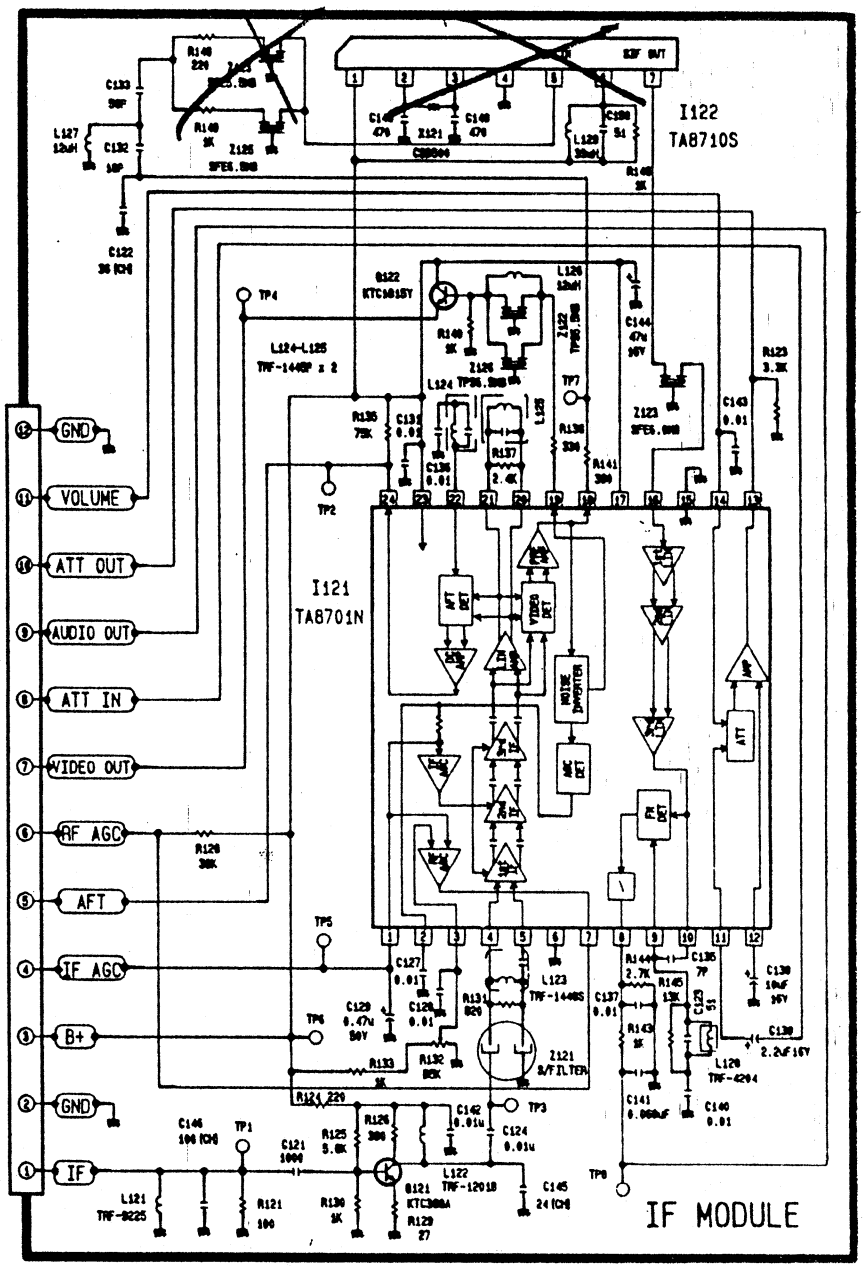
SAFETY CAUTION :

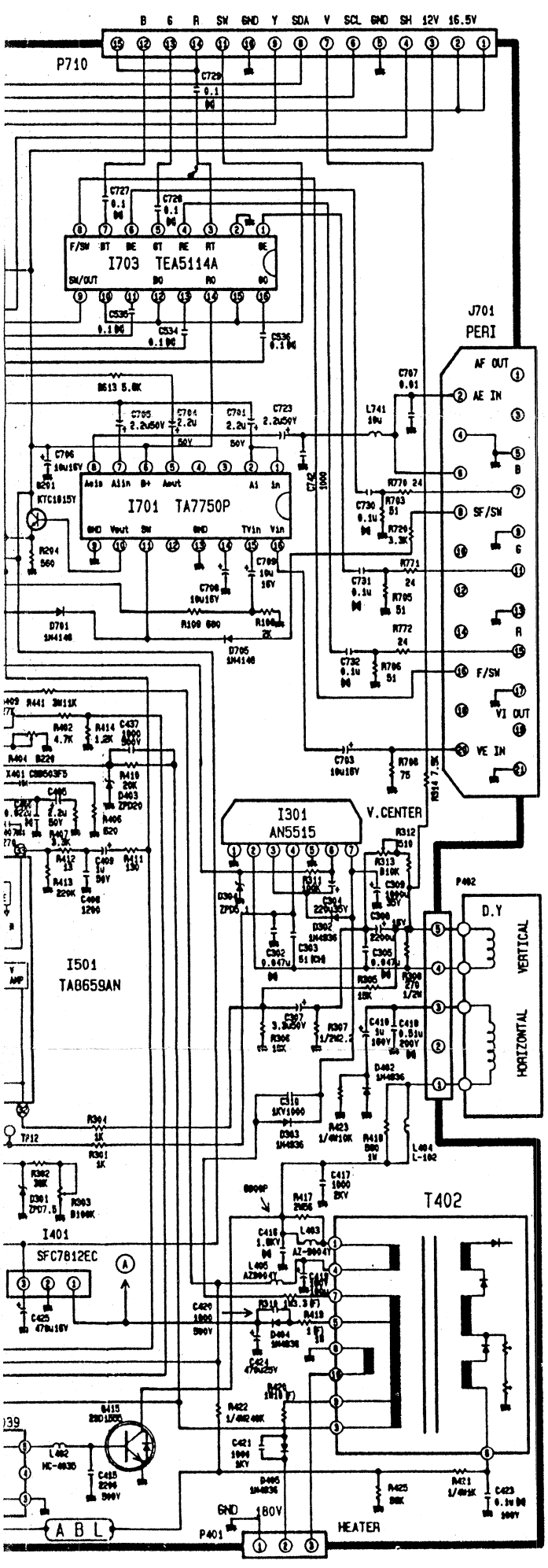
BEFORE SERVICING THIS CHASSIS IT IS IMPORTANT THAT THE SERVICE TECHNICIAN READ AND FOLLOW THE "X-RAY RADIATION PRECAUTION . "SAFETY PRECAUTIONS" AND "PRODUCT SAFETY NOTICE" IN THE SERVICE MANUAL.

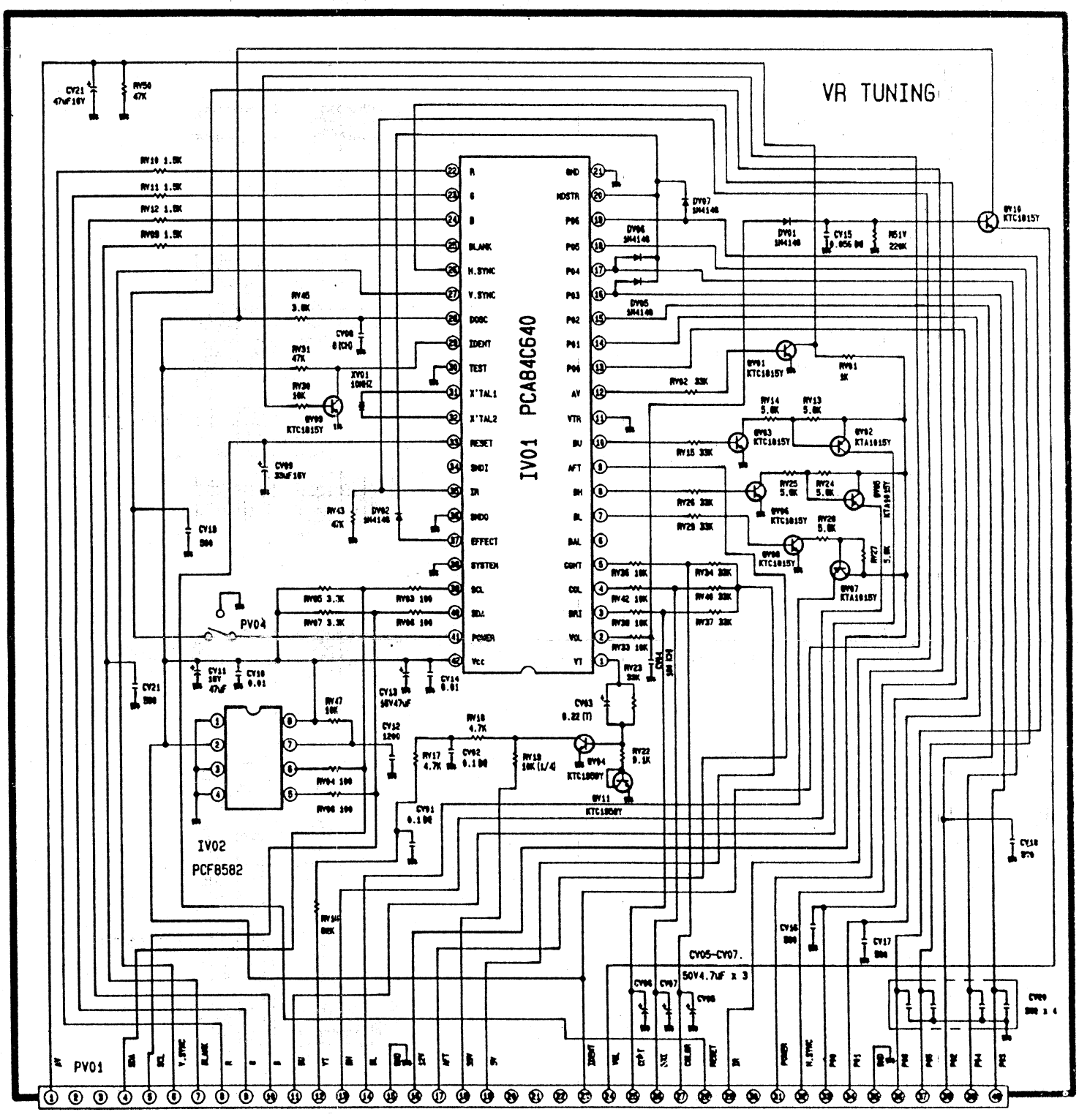
PRODUCT SAFETY NOTE :

SHADED COMPONENTS HAVE SPECIAL CHARATERISTICS IMPORTANT TO SAFETY AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL OR SPECIFIED IN THE PARTS LIST.
DONT'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

LOCATION	PART NAME	20"	21"
—	CRT	A34JLL90X	A51JSW90X02
—	SOCKET CRT	I-CSM6113	CVT3308-0901
T402	FBT	DCF-2077	KFS-60676
L804	D.COIL	SK-2011-B	DC-2070
R542	R FUSIBLE	1W 4.70HM	1W 6.20HM
C307	C ELECTRO	3.3uF 50V	2.2uF 50V
C417	C CERA	2KV 470PF	2KV 1000PF
C418	C MILAR	200V 0.51uF	200V 0.36uF
T803	TRANS SMPS	TSM-4225	TSM-4245
C437	C CERA	—	500V 100PF







SCHEMATIC DIAGRAM

CHASSIS : C-520

(DTV - 2049TS)

NOTES :

1. RESISTANCE VALUES ARE IN OHMS K = 1000 M = 1000000
2. CAPACITANCE VALUES 1.0 AND ABOVE ARE IN pF THOSE BELOW ARE IN uF EXCEPT AS INDICATED.
3. INDUCTOR VALUES IN uH EXCEPT AS INDICATED.
4. VOLTAGES ARE MEASURED FROM CHASSIS GROUND TO POINT INDICATED WITH A " VTVM " WHILE RECEIVING A COLOR BAR SIGNAL WITH ALL CONTROLS SET TO THE MAXIMUM POSITION. (FOR A NOMINAL LINE VOLTAGE AC 110-260V 50HZ).
5. SINCE THE CIRCUIT DIAGRAM IS A STANDARD ONE THE CIRCUIT AND CIRCUIT CONSTANTS MAY BE SUBJECT TO CHANGE FOR IMPROVEMENT WITHOUT ANY NOTICE.

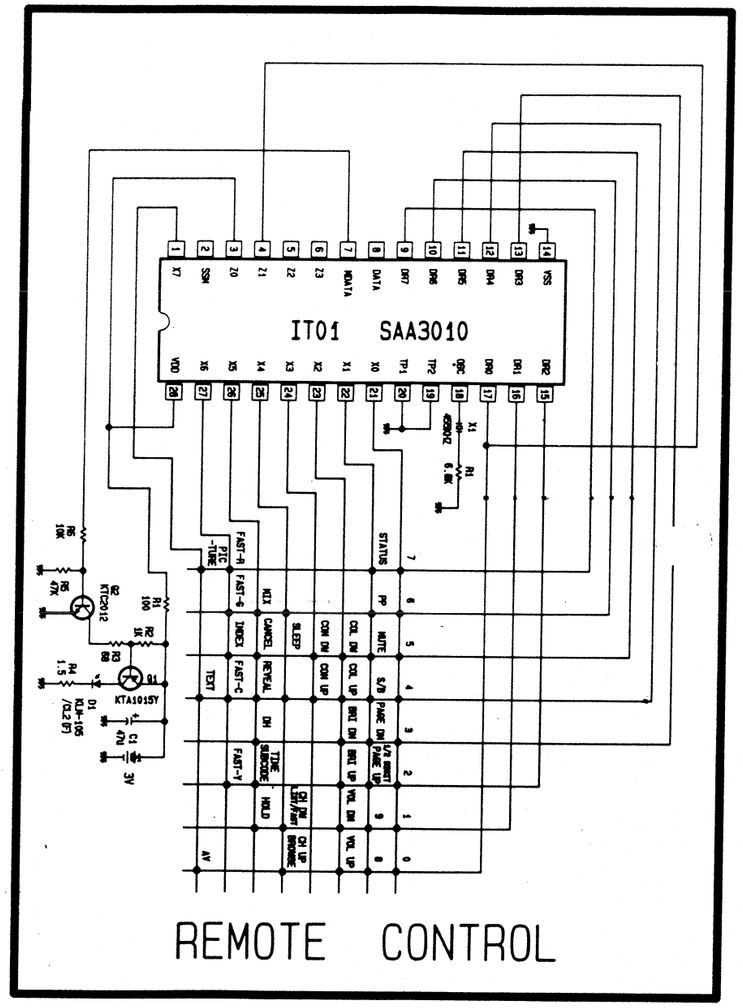
SAFETY CAUTION :

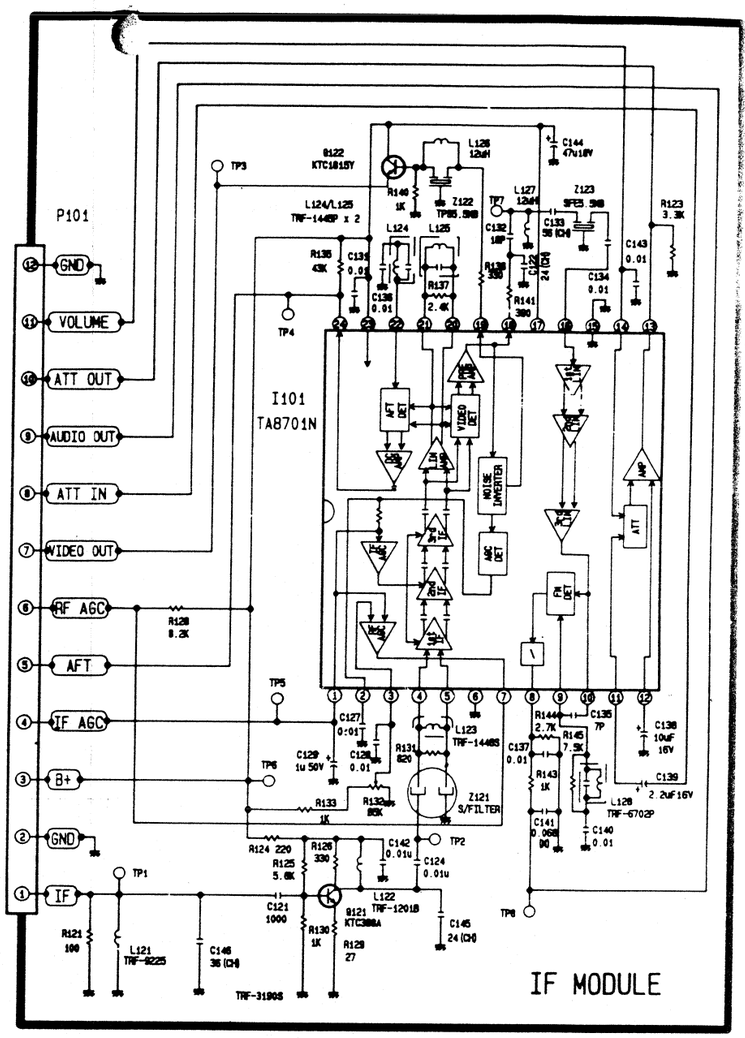
BEFORE SERVICING THIS CHASSIS IT IS IMPORTANT THAT THE SERVICE TECHNICIAN READ AND FOLLOW THE "X-RAY RADIATION PRECAUTION . "SAFETY PRECAUTIONS" AND "PRODUCT SAFETY NOTICE" IN THE SERVICE MANUAL.

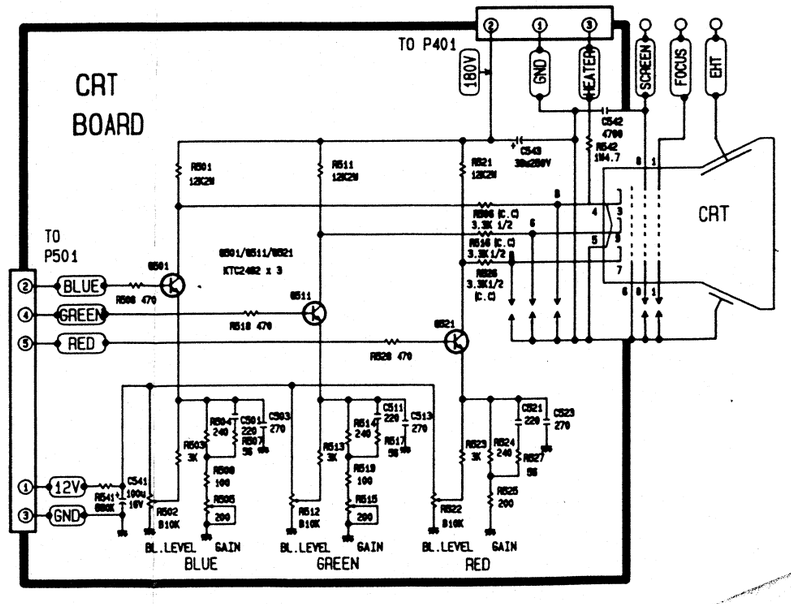
PRODUCT SAFETY NOTE :

SHADED COMPONENTS HAVE SPECIAL CHARATERISTICS IMPORTANT TO SAFETY AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL OR SPECIFIED IN THE PARTS LIST.
DONT'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

LOCATION	PART NAME	20"	21"
——	CRT	A34JLL90X	A51JSW90X02
——	SOCKET CRT	I-CSM6113	CVT3308-0901
T402	FBT	DCF-2077	KFS-60676
L804	D.COIL	SK-2011-B	DC-2070
R542	R FUSIBLE	1W 4.70HM	1W 6.20HM
C307	C ELECTRO	3.3uF 50V	2.2uF 50V
C417	C CERA	2KV 470PF	2KV 1000PF
C418	C MILAR	200V 0.51uF	200V 0.36uF
T803	TRANS SMPS	TSM-4225	TSM-4245
C437	C CERA	——	500V 100PF

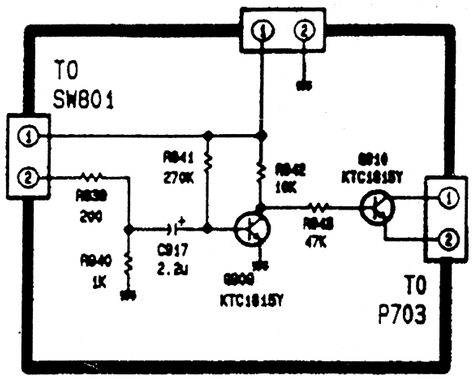






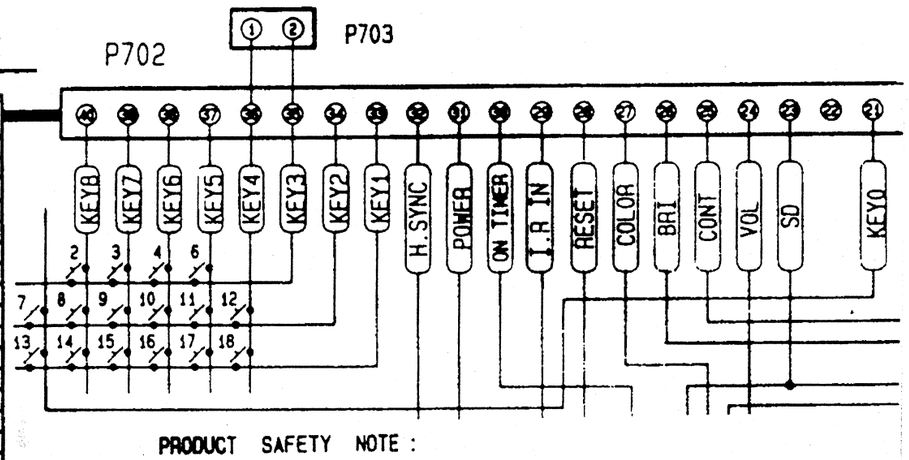
SUPRA

MODEL STV-2152FS
C-500 CHASSIS



KEY FUNCTION TABLE

LOCATION	KEY NO	FUNCTION
SW701	6	TV/VIDEO
	18	CH UP
SW702	12	CH DOWN
	17	VOLUME UP
SW703	11	VOLUME DOWN
	15	FINE TUNING UP
SW704	9	DOWN
	5	AUTO SEARCH UP
SW705	7	DOWN
	8	CH CALL/FAS
SW706	14	PRESET
	3	AFT/BAND
SW707	4	SKIP
SW708	16	ANALOG UP
SW709	10	ANALOG DOWN
SW710	2	ANALOG SELECT

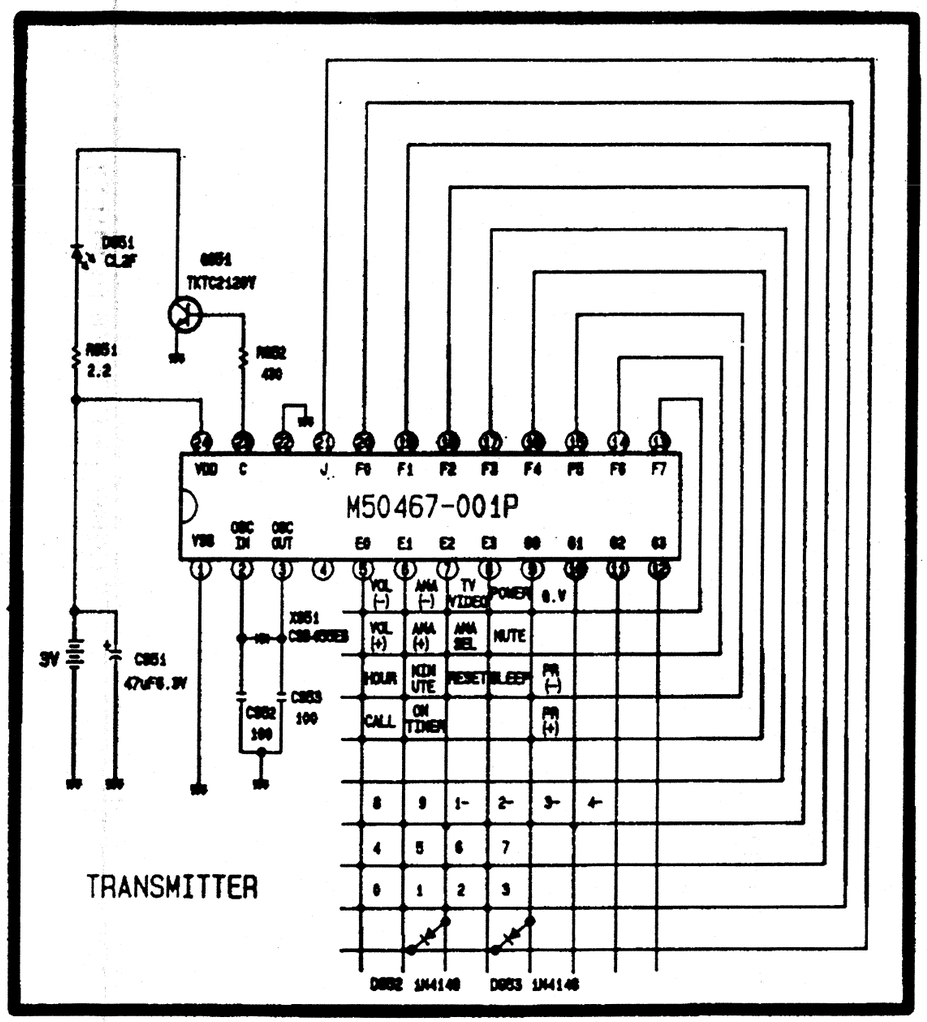


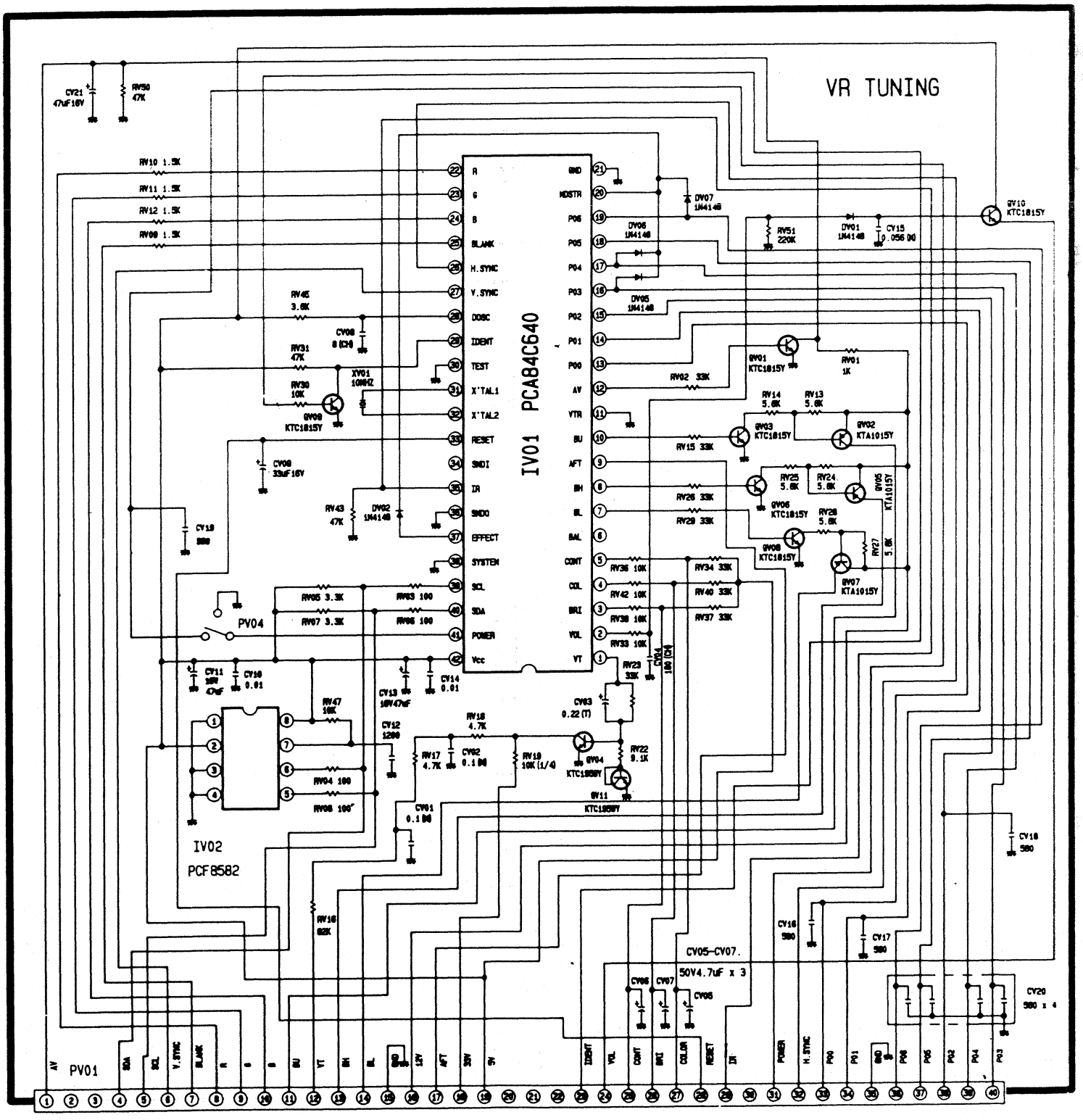
PRODUCT SAFETY NOTE :

SHADED COMPONENTS HAVE SPECIAL CHARATERISTICS IMPORTANT TO SAFETY AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL OR SPECIFIED IN THE PARTS LIST.

DONT'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

LOCATION	PART NAME	14"	20"	21"
—	CRT	A34JLL90X	A48JLL90X	A51JSW90X02
—	SOCKET CRT	I-CSM6113	I-CSM6113	CVT3308-0901
T402	FBT	DCF-1577A	DCF-2077	KFS-60676
L404	COIL LIN	L-125	L-102	L-102
L804	D.COIL	SK-1412-B	SK-2011-B	DC-2070
R211	R CARBON	22K oHM	62K oHM	62K oHM
R225	R CARBON	47K oHM	82K oHM	82K oHM
R542	R FUSIBLE	1W 3.6 oHM	1W 4.7 oHM	1W 6.2 oHM
C307	C ELECTRO	3.3uF 50V	3.3uF 50V	2.2uF 50V
C416	C MYLAR	1.6KV 5600pF	1.6KV 6900pF	1.6KV 8200pF
C417	C CERA	2KV 470pF	2KV 470pF	
C418	C MYLAR	200V 0.51uF	200V 0.51uF	200V 0.36uF
T803	TRANS SMPS	TSH-4225	TSH-4225	TSH-4245
C437	C CERA			50V 100PF
Q402	TR	2SD1554	2SD1555	2SD1555




VR TUNING
IV01 PCA84C640
IV02
PCF8582
PV01
PV04
CV05-CV07.
50V4.7uF x 3

C-520 TELETEXT MODULE